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Chemical Trade Journal,
Supplement, January 24, 1891.

THE

CHEMICAL TRADE JOURNAL:

A WEEKLY NEWSPAPER DEVOTED TO

The Commercial Aspect of the Chemical and Allied Industries.

EDITED BY

GEORGE E. DAVIS,

FORMERLY ONE OF HER MAJESTY'S INSPECTORS OF ALKALI WORKS,
CHEMICAL ENGINEER AND CONSULTING CHEMIST.

VOLUME VII.

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Articles, reports, and correspondence on all matters of interest to the Chemical and allied industries, home and foreign, are solicited. Correspondents should condense their matter as much as possible, write on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication. Sketches should be sent on separate sheets.

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CHEMICAL GLASSWORK.

WE often hear of German superiority in things chemical, but the argument generally has reference to the alleged superiority of German chemists over English ones, and, judging from controversies which have taken place in our earlier volumes, there are two opinions on this subject. Our present purpose, however, is to point to a different aspect of the question. Those of our readers who have had occasion to fit up a laboratory for the testing of their own or other people's materials, know, to a greater or less extent, that most if not all the delicate and intricate glasswork used in English laboratories is imported from Germany. We trust that our platform is broad enough to include sympathy for the German, and we are second to none in our admiration of his skill. Still we are English, and experience an ebullition of patriotic regret when we consider that this industry is entirely, or nearly so, in German hands. Who that has tried to do so could procure a Le Bel, Henninger tube, of English make, for fractionating benzol? or, again, who could procure English-made thin glass beakers, flasks, pipettes, potash bulbs, burettes, nitrometers, *et hoc genus omne?* Who, indeed? Alas, we can go through the whole country, from Dan to Beer-Sheba, and cry, "'tis all German." We have sought for a sufficient cause for this state of things, but with indifferent success. We can see little but the proverbial conservatism of English workmen for it. For, consider what there is, or is not, about a Liebig's potash bulb that an English workman could not do if he tried; or, again, a Geissler's bulb for the same purpose, or, to pass for a moment to other and somewhat different articles, what difficulty is there about a glass stopcock, a glass three way tap, or a burette accurately graduated and stoppered; or, again, any of the newer forms of nitrometer, such as the volumeter, etc., with its double-bored stopcocks? Surely, patience and a little manual dexterity are sufficient to accomplish the manufacture. We have been told that it is the low price of these articles that renders the labourer's task an unremunerative one, but, on looking over the prices at which the goods are sold, we fail to see this.

We have also heard that it is the peculiar quality of the German glass that enables this class of work to be better done there, but if this be so, English glass makers are at fault, for the same argument has been applied to the flasks and beakers, the *hard* glass which is a totally distinct thing from the *soft* workable glass. This amounts to an admission that the German is victorious all along the line, for have we not also heard of the superiority of Berlin, Meissen, and Dresden porcelain? These are not glass goods it is true, but considering that they form part of the *materiel* of the laboratory, we may be permitted to use them as an illustration of the tacit way in which English manufacturers appear to have allowed an important industry to be snatched out of their fingers. We would here point out that quite recently this industry has expanded very considerably. The idea that it was a trade not worth following, originated in the

days when chemists had either more time, or else less money—the days when they bought as little apparatus as possible, and made the rest out of Florence flasks and—the word has almost become obsolete—gallipots. But those were the good old days—"all days when old are good." We live under different conditions now, the growth of chemistry as a branch of our national system of education, has increased the demand for these goods; the development of technological chemistry has produced new forms of apparatus, and also created a demand for them. Any one who glances at the elaborate trade lists of the dealers to-day, and recalls what they were twenty or even ten years ago, will need no telling that the trade has increased enormously, and that while the English manufacturer might, in the old days above referred to, be content to allow the German glassworker to take root, even as a grain of mustard seed, the time has come when it is a seed no longer, and when an effort should be made to compete with Germany in this field of industry. We are not of those who believe it to be impossible for English workmen to compete with the Germans in this direction. On the contrary, we believe there is in him all that is necessary to achieve a victory. But where is the employer?

Legal.

IN THE CHANCERY DIVISION OF THE HIGH COURT OF JUSTICE.

On Tuesday, *Before* Mr. Justice Kekewich.

RAWES v. CHANCE BROTHERS.

(From the Manchester Guardian.)

A case was concluded on Monday last, in the Chancery Division which has occupied Mr. Justice Kekewich's attention for six days, and was characterised by the Attorney General, as one of the most remarkable patent cases that had ever been before the courts. There appeared for the plaintiff, with the Attorney General (Sir R. Webster, Q.C., M.P.), Mr. Theodore Aston, Q.C., and Mr. Fletcher Moulton, Q.C., M.P., there being with them Mr. Lawson and Mr. Wallace; and for the defendants, Sir Horace Davey, Q.C., M.P., Mr. S. M. Warmington, Q.C., M.P., and Mr. Carpmael.

The plaintiff, Mr. Francis Bristow Rawes, the Attorney General said, brought the action against Messrs. Chance Brothers, carrying on business at Oldbury, in Worcestershire, and also by a considerable number of their licensees, for an infringement of the letters patent granted to him in respect of the utilisation of the waste products from the manufacture of soda. To the injuncton he thus asked for, he added a demand for an account, and the surrender to him or the destruction of sulphur or other products made in the infringement of the patent. To these demands the defendants pleaded that the plaintiff's patent was bad for want of novelty, and that having been anticipated over and over again, it was not legally patentable. The speech of the Attorney General, opening the plaintiff's case, showed that for many years the manufacture of the soda of commerce had been an important industry in this country, involving annually the importation of hundreds of thousands of tons of sulphur in the form of pyrites. In the process of manufacture, vast quantities of waste were produced, proving not only an incubus to the manufacturers, but sometimes a nuisance to the inhabitants. For utilising this waste, many schemes had been tried, now for turning it into cement, and then for making it into bricks; but, above all, scientific investigation had been encouraged by the knowledge that these residuals contained some nine-tenths of the sulphur used in the process of manufacturing the soda. The chemical laws bearing on the subject were well known, and there was quite an interesting literature attaching to it, extending certainly from 1837 down to 1876. The remarkable thing was that, despite this knowledge, the problem of successfully treating these residuals remained unsolved until the investigations and discoveries of the plaintiff in this action, on which he based the letters patent granted to him in 1882. Perhaps the nearest approach to success was obtained by a Mr. Gossage, whose discoveries were suggested by the defendants to have directly anticipated Mr. Rawes's process. Mr. Gossage died two or three years ago,, after having spent thirty years of life and a fortune in endeavouring to solve the problem. Proceeding to explain the technical process of producing soda, by treating common salt with sulphuric acid in a furnace, and subjecting the product to a great heat, leading to a crude soda which has to be purified, the Attorney General went on to say that there remained the insoluble residue known in all the districts of alkali manufacture by the enormous unutilised heaps of it, and called vat or alkali waste, consisting, roughly speaking, of one-third sulphide of calcium, one-third carbonate of calcium, and one third water, and involving in its treatment three substances—calcium, barium, and strontium. In the treatment of this waste Mr Rawes discovered three causes for Mr. Gossage's want of success. Perhaps the most important of these was a provision for suspension by agitation preventing the calcium or sulphide of calcium from settling down, which was effected by the use of carbonic acid gas; next he discovered that the air must be excluded; and lastly he found that there must be an intermedium in order to enable the carbonic acid to get at each of the particles by holding each molecule separate. It was in this way that the plaintiff claimed to have solved a problem of great interest and industrial importance, as making the process of extracting sulphur from alkali waste commercially successful, and he sought to restrain the defendants' infringement of his patented rights in it.

The evidence in support of the plaintiff's case, on the basis of the outline thus presented, consisted first of the testimony of Mr. George E Davis, consulting chemist, of Manchester, and editor of the *Chemical Trade Journal*, who described the plaintiff's process and specification, and its differentiation from preceding efforts to utilise the waste. He was cross-examined by Sir Horace Davey for the defendants through the greater part of the first afternoon of the hearing, all the following day, and for nearly a couple of hours on the third day. The next witness for the plaintiff was Professor Dupré, Government Examiner of Explosives, who, sketching in outline the efforts to utilise the waste, said some of the plans were tried for a time, but none were commercially successful until Mr. Rawes's. The cost of removing it had itself been heavy, but by Mr. Rawes's process it could be utilised. Another of the plaintiff's witnesses was Dr. T. Stevenson, vice-president of the Institute of Chemistry, lecturer in chemistry at Guy's Hospital, and official analyst to the Home Office. Mr. Rawes's specification he thought workable, a proper specification of the process of extracting sulphur from alkali waste, and an improvement upon all other systems of which he was aware. Yesterday Mr. Rawes himself entered the box with the view of showing the originality and effectiveness of his patent. Take his system out of the defendants' treatment, and he said there would be nothing left in Chance's. In cross-examination by Mr. Warmington plaintiff said that in 1882 he was engaged in chemical investigation, but was a private gentleman living on his means. He was not a practical chemist, although he had dabbled in chemistry for the last 40 years.

The Court at this stage adjourned for luncheon. On their return into court it was announced that there was a prospect of their arriving at an agreement, and after some consultation,

The Attorney-General said he was pleased to say the parties had come to terms, which having been agreed to and endorsed on the briefs, it would be unnecessary to state. It was, however, right to say that the patent would become the property of Messrs. Chance, and that upon the terms offered by them in the month of January in the present year. He should also say that there was not the slightest ground for imputing to them—nor, his Lordship would bear him out in saying, had he attempted to impute—that they had been guilty of dishonourable conduct. The action, with the consent of his Lordship, would be withdrawn on the terms endorsed on the briefs, certain documents being prepared.

His Lordship intimated that he was glad to be relieved from deciding upon a case involving such issues as the present, and that the settlement was a proper one; and the proceedings concluded.

PETROLEUM CONTRACTS.—A SUGGESTION FOR ARBITRATION.

The Court of Queen's Bench recently decided the case of Noble Brothers' Petroleum Production Company *v.* P. Stewart & Co. This was a case which had arisen out of large contracts as to petroleum oil. The plaintiffs own petroleum wells in the Caucasus and elsewhere, and deal extensively in petroleum both in the United Kingdom and elsewhere. The defendants were described as one of the largest importers of petroleum in Liverpool. In April, 1889, the parties agreed that the plaintiffs should confer on the defendants the exclusive right of import to all ports on the west coast of Great Britain between Cardiff and Carlisle, of their refined petroleum, for five years, and that the defendants should purchase as much refined petroleum as a steamer of about 3,000 tons would carry, running regularly between Batoum and the United Kingdom; and that in default of any special arrangement the cargo should be invoiced at the average market price at which the highest qualities of Russian refined petroleum in barrels had been selling in Liverpool during a period of six weeks before the arrival of the steamer, the defendants to have an allowance off the

price for expenses; and the defendants, it was alleged, expressly promised the plaintiffs that they would do their best to obtain for the plaintiffs a good position on the market, &c. Three cargoes of petroleum were duly shipped, and were taken by the defendants at specially arranged prices. A fourth cargo had also been shipped, and had recently arrived in the Mersey. As no special arrangement could be made as to the price, it was agreed that the defendants should pay—and they had paid—for the cargo at the price alleged by them to be the average market price. The price alleged by the defendants to be the average market price was, as the plaintiffs alleged, not the average market price at which the highest qualities of Russian refined petroleum had been selling in Liverpool during the six weeks before the arrival of the steamer, the average price being, as the plaintiffs stated, judging by actual quotations and sales, three-sixteenths of a penny per gallon more, so that the additional sum due to the plaintiffs for the cargo would, it was stated, be £804., and for this the plaintiffs sued, not only for the money loss, but for the injury to their business, and they complained that the defendants not only had not done their best to secure fair prices for the plaintiffs, but the reverse, and had worked the agreement unfairly against them. Other cargoes coming on, similar actions were contemplated or apprehended, and, indeed, the writ had been issued in another action in respect of another cargo for £887. Mr. Low moved on behalf of the defendants to refer the action to arbitration under the usual arbitration clause in the contract as arising out of "a dispute under the contract." Lord Coleridge said he thought the actions could not be compulsorily referred to arbitration, as they arose, not out of a dispute on the contract, but out of alleged unfair conduct, tending to defeat it—*i.e.*, the alleged manipulation of the market so as unfairly to lower the market price, and so prejudice the plaintiffs in the working of the contract. That was a cause of action which did not come strictly within the terms of the arbitration clause in the contract as arising out of disputes under the contract, so that it should be compulsorily referred to arbitration. It appeared to be rather a case which was proper to be tried by a jury. Mr. Justice Wills concurred and the application, therefore, to refer the actions to arbitration was dismissed.

PREPARATION OF PICRIC ACID.

A PROCESS has recently been patented in Germany for the production of picric acid from crude phenol. It is based upon the following observations:—(1) Phenol-sulphonic acids are much more easily nitrated than phenol itself. (2) The sulphonic acids of crystalline phenol are more readily formed than the corresponding compounds of cresol, &c. (3) The uncrystallisable constituents of crude phenol may be first nitrated and then removed, (*a*) by the use of the calculated quantity of acid, (*b*) by regulating the temperature. The residual pure phenol is then nitrated and treated in the usual manner. Following on the above observations two processes have been worked out. In the first, the crude phenol is treated with a quantity of sulphuric acid equivalent to the crystallised phenol present; the resulting sulphonic acid is dissolved in water, and decanted from oily impurities, and the solution treated with nitric acid. Should any cresol be present it will be unattacked, and may be separated by treating the picric acid with sulphuric acid, and afterwards washing with water. In the second process the crude phenol is treated with a large excess of sulphuric acid. The sulphonic acids are dissolved in water, and treated with sufficient nitric acid to nitrate the cresol compounds. On cooling, the nitro-cresol separates as an oil, and may be removed. This process may be varied by treating the mixed sulphonic acids with an excess of nitric acid. If the resulting compounds be then treated at 90°—100° C. with water containing 12 per cent. sulphuric acid, the trinitro-cresol will separate as an oil from the picric acid.

FOOD FROM WOOD FIBRE.

PROBABLY no modern science presents a wider field for speculation than that of chemistry, and more especially, perhaps, that branch of the science which treats of organic compounds. Since the day when Wohler overthrew for ever the notion that organic substances were exclusively the products of the operation of a so-called vital force, by his discovery of the synthesis of urea, a great number of bodies, hitherto obtained only in nature's laboratory, have been successfully built up as the result of a careful and most minute study of their exact nature. The discovery of the preparation of substances by artifice, more particularly the dyes, has, as a matter of course, influenced very considerably home and foreign industries. What shall be said, then, when chemistry promises to solve hard problems of political and social economy.

In an address delivered at Heidelberg, by no less eminent an authority than Victor Meyer, it is announced that "we may reasonably hope that chemistry will teach us to make the fibre of wood a source of human food." What an enormous stock of food, then, will be found, if this becomes possible, in the wood of our forests, or even in grass or straw. The fibre of wood consists essentially of cellulin. Can this be made to change into starch? Starch has exactly the same percentage in composition, but, as every one knows, it differs very much in its properties, and the nature of its molecule is probably much more complex. Cellulin is of little or no dietetic value, and is not altered, like starch, in boiling water. It readily gives glucose when treated with sulphuric acid, as is easily shown when cotton wool, which is practically pure cellulin, is merely immersed in it. Starch gives the same product when boiled with weak acid.

The author further quotes the researches of Hellreigel, which go to show beyond dispute that certain plants transform atmospheric nitrogen into albumen, and that this process can be improved by suitable treatment. The production, therefore, of starch from cellulin, together with the enforced increase of albumen in plants, would, he adds, in reality signify the abolition of the bread question. It must be borne in mind, however, that theory, fascinating and promising though it may be, is not always capable of being followed up by a practical result.—*Kuhlow.*

GERMAN v. SWISS ANTIPYRIN.

A LAWSUIT concerning the infringement of the patent for "Dr. Knorr's antipyrin" which is held by the dyeworks "formerly Meister, Lucius, and Bruning," in Höchst-on-Maine, has just been decided by the "Landgericht" of Hamburg. The complainants were the holders of the patent, and the defendant Mr. Erwin Kunhardt, proprietor of the wholesale drug firm of G. Lippmann and Geffcken, in Hamburg. The case against Kunhardt was that he had been in the habit of ordering "antipyrin" from a firm in Basle, Switzerland, who also manufacture the article, and sold the Swiss drug to customers of his in Germany, thereby infringing the rights of the holders of Dr. Knorr's patent. The value of Swiss antipyrin purchased by Kunhardt in the course of about a year was said to be from 7,000m. to 8,000m. The Basle drug is cheaper than the German, but it is regarded in Germany as a pirate article, and may not be sold there. Mr. Kunhardt's defence was that he purchased the Basle antipyrin for export only, and kept it stored at his bonded warehouse, and that, moreover, he was not aware that Dr. Knorr's antipyrin was protected by patent in Germany. It was shown, however, that the defendant's firm had supplied the Basle antipyrin to a pharmacist in Kiel, Germany, who had secured a contract of medicines for the Navy, and that the packages sent to Kiel bore the inscription "May not be sold in Germany." The public prosecutor demanded that the defendant should be fined 1,000m. and that the sentence should be publicly advertised. The counsel for the Höchst factory demanded an additional fine of 700m. on behalf of that firm. The defence suggested that there was no case, and demanded acquittal.

In the end Mr. Kunhardt was found guilty and fined 300m., or in default thirty days' imprisonment. He was also condemned to pay the costs, and an indemnity of 700m. to the Höchst factory, and to the advertising of the sentence in a Hamburg public journal. The stock of Swiss antipyrin was confiscated.

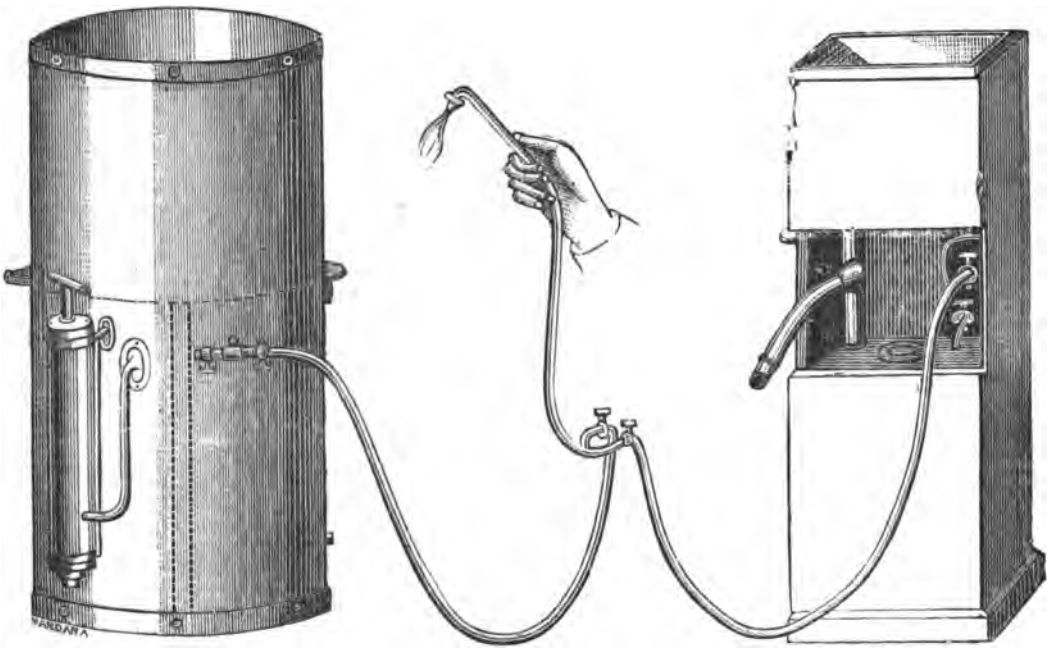
QUICKSILVER IN THE ZEERUST DISTRICT.—Mr. W. J. Smith, of Zeerust, is at present in Cape Town, and advantage was taken by an *Argus* reporter to ask him a few questions about the alleged valuable deposit of quicksilver at Marico, in the Zeerust district. The substance of Mr. Smith's statement is that some time ago, whilst inspecting Witkop Farm, his attention was attracted by a peculiar formation of rocks there, and also by the colour—vermillion—of the rock itself, indicating, as it did, the presence of quicksilver. Since then operations have been carried on by Mr. Lemmert, jun. (whose father owns the farm), and specimens of the rock have been submitted to experts, including Dr. Hahn, with the result that a rich mineral discovery has been made. Quicksilver exists in very large quantities and of excellent quality, whilst silver, zinc, lead, and other minerals are abundant. The Witkop mine is at present worked by a syndicate with successful results; and this success led to prospecting operations on the adjoining farm of Buffelshoek, where precisely similar conditions were observed, and where a scratching of the surface has revealed the fact that there are equally good results to be anticipated from the mine being worked. A syndicate has been formed to work this mine as well as that of Witkop; and a movement is also in progress for further exploration in the district, where quicksilver is evidently abundant. Professor Hahn has expressed an opinion that the quicksilver mine at Witkop is one of the richest in the world. Mr. Smith's statements were borne out by Mr. B. D. Mudie, of Zeerust, and also by Mr. A. C. de Villiers, of the Paarl, both of whom are well acquainted with the properties.

CORTIN'S PLUMBERS' AIR PUMP AND MACHINE.

We have had occasion, some twelve months or more ago, to notice the acid valves of Mr. Cortin. We have now to bring before our readers another of the specialities of this enterprising manufacturer of chemical plant. The "Special" Plumbers' Air Pump and Machine, shown in the figures, are well known in the North of England as convenient apparatus for lead burning, particularly chamber work. Those familiar with this class of work and the older apparatus used by chemical plumbers will not need to be reminded of the frequency with which the plumber has been discovered, in a remote part of the chambers, waiting for his lad who has "gone to the shop for strip," or for the scraper, etc.; the said waiting being due to the fact that the blowing apparatus has no means of maintaining pressure when the pump is stopped. In the apparatus of Mr. Cortin, this defect is remedied. Instead of pumping air direct to the burner, the necessary pressure is obtained by means of two chambers or compartments placed

PUMP No. 1.

MACHINE No. 1.



one over the other, as shown in "pump No. 1" in the figure, and connected by means of a pipe shown by the dotted lines passing from the bottom of the upper to within a short distance of the bottom of the lower chamber, through which pipe water can pass freely.

The upper chamber is charged with water, which serves to displace the air in the lower chamber when the air tap is opened, and this at a pressure corresponding to the head of water. The air tap, of course, is connected with the burner. As the water level falls in the upper compartment, the air pump fixed as shown in the figure, at the side of the lower chamber, is used to force the water up again by pumping air into the lower chamber, the important feature being that when this has been done, and the upper and lower chambers are full of water and air respectively, the apparatus is capable of working for a considerable interval without attention. The pump shown in the figure is capable of supplying four plumbers working with heavy lead.

The hydrogen generator, or "machine," as it is technically called, is a well-made substantial machine, consisting, as shown in the figure "Machine No. 1," of two compartments communicating with each other by a pipe, by means of a handhole the lower vessel is charged with cake zinc, and then made air tight, and dilute sulphuric acid introduced from the upper vessel. The evolved hydrogen expels the air and passes out through the safety box or "trap," shown on the right-hand side of the space between the upper and lower vessels, and thence to the burner.

Vaseline Harness Composition.—Prussian blue, in fine powder, ¼ oz.; lampblack, 4 oz.; treacle, 2 oz.; soft soap, 2 oz. Mix together in a large Wedgwood mortar, previously warmed, and add:—Vaseline, 6 oz.; cerasin, 5 oz.; yellow resin, ½ oz. Melted together; then sufficient turpentine to give the composition the proper consistency. Mix thoroughly.

THE POLLUTION OF THE IRWELL BY MANUFACTURERS.

A CORRESPONDENT in the *Manchester Guardian* says:—"The present deplorable state of the river Irwell arises mainly from two causes—the discharge into the river of town sewage, and the pollution from works and manufactories of every description. Within the watershed of the Irwell, an area of over 300 square miles, it is computed that there are more than a million inhabitants, whose sewage passes into the river, while the banks of the river and its contributory streams are lined with innumerable manufactories, discharging their waste water, ashes, and chemical refuse into it in enormous quantities. Dr. Burghardt, who has made extensive investigations into this subject, comes to the conclusion that half of the total pollution of the Irwell before it reaches Throstle Nest weir is due to the manufacturers. The Salford Corporation has availed itself of the provisions of the Rivers Pollution Act, and in the last few years has induced many of the local authorities in the watershed to deal with the sewage portion of the pollution; and from the reports of the various Local Government Board inquiries and descriptions of sewage schemes the public has been made acquainted with the progress in this direction. Little attention, however, has been directed to the equally important advances which have been made in inducing private individuals to prevent as far as possible the pollution of the river from the discharge of their waste products. It would be impossible to enumerate here one half of the instances of this public spirit, but the following cases will serve to show that the manufacturers are awakening to the knowledge that it is to their own interest to discharge only clear water, in order that they may ultimately derive the same benefit from their neighbours higher up the stream. As one manufacturer put the case, 'if he could only receive water as pure as he sent it out, he should be well paid for his trouble.' At the paper works of Messrs. Yates, Duxbury and Son, Hall-i'th'-Wood, Bolton, an extensive series of settling tanks has been constructed in order to allow the solid impurities to precipitate from the waste water before turning it into the Tottington Brook. The tanks are six in number, ranging in length from 56 to 128 feet, and are of a uniform width of 22 feet. Before entering the first tank the waste water is passed through three strainers, formed of perpendicular iron bars, which arrest all the larger refuse. A portion of the impurities settles to the bottom of the first tank, and the top stratum of comparatively clear liquid flows over sluices into the second tank, where the process of settling is again carried on; and in like manner through the whole series of tanks. In addition, two special filters have been constructed for dealing with the lime dregs produced in the works. The refuse liquid is discharged into two iron tanks, each 13 feet square, in which is placed a layer of fine coke 18 inches in thickness, with a space below for the filtered liquid to collect before flowing away. The surface of the coke is cleared of the deposited lime by scraping, and to

protect it from displacement in this process the coke is partly covered by strips of wood placed about an inch apart. Messrs. James Kenyon and Sons, of Bury, woollen scourers, have constructed three settling tanks, whose total length is something like 100 feet. After leaving the last tank the clarified liquid is passed into a wooden shoot, and escapes through small perforations over the surface of a filter bed composed of fine cinders. On leaving this the effluent has the clearness of drinking water, although turbid and creamy with fuller's earth on first entering the tanks. Messrs. Olive Brothers, of the Woolfold Paper Mills, Bury, have three large settling tanks, arranged side by side, covering a space of about 87 by 80 feet, in addition to a natural channel over 600 feet long, which has been utilised to precipitate the bulk of the impurities from the liquid on its way from the works to the tanks. Another firm of paper manufacturers in Bury, Messrs. J. R. Crompton and Brothers, although restricted in accommodation through being bounded on one side by the Irwell and on the other by the Manchester, Bolton, and Bury Canal, have formed two large tanks of a taper form, one being 109 feet in length, and the other 73 feet. In Radcliffe, Messrs. John Wild and Son, paper manufacturers, pass the waste water from their works through a series of five tanks, the total length being 125 feet, and the width 12 feet. The bottom of these tanks consists of a layer of cinders three feet in thickness, on a natural bed of gravel, through which much of the liquid percolates. The East Lancashire Paper Works Company, of Radcliffe, have constructed two settling tanks, the length of each being 80 feet, and the width 40 feet, as well as four smaller tanks specially designed for dealing with the lime dregs. This firm is fortunate in having found a profitable use for the sludge deposited in the tanks. Instead of being carted away as a useless encumbrance, it is pressed into brick form, dried in the sun, and then burned in a closed kiln. Under this treatment it crumbles into a powder, which forms an excellent lime for mortar, setting rapidly and with the hardness of cement.

The best results, as it is natural to expect, are obtained in those cases where filters are employed, after the bulk of the impurities have been removed from the waste water by settling or other means. It is not, however, always possible to secure space for filter beds such as those described above, and various forms of mechanical filter have been introduced with the object of treating a large quantity of liquid in a limited space. A recent invention of this class was lately exhibited before the Borough Engineer of Salford and the managers of the companies who are now conducting experiments in the treatment of sewage at the Salford sewage works. The construction of the machine was explained by the inventor, Mr. William Birch, proprietor of the Milton-street Ironworks, Lower Broughton. It consists essentially of an endless band of woollen felt revolving at a slow speed over guide rollers. A part of the felt passes horizontally over a shallow tank, and the liquid to be filtered, being discharged on the upper surface of the felt, percolates rapidly through into the tank below, whence it is carried off by a discharge pipe. A valuable feature in the machine consists in its being self-cleansing by a continuous automatic action. The portion of the felt which has become coated with the residue or slime from the liquid is carried upwards by the guide rollers, when a radial arm with a rapid downward motion presses a steel roller along the slimy surface, and the residue is thrown off and falls into a special receiver. This cleansing action is repeated at short intervals, so that the surface of the felt is prepared for the reception of a fresh supply of liquid. Coalpit water, tinged with iron ores and ochres and liquids of every description, where the impurities were simply in suspension, were rapidly clarified. The total length of the felt band was 22 feet, the width being 30 inches, and the thickness ¼ inch. Mr. Birch claims that he can filter with this machine, which stands on a space six feet square, at the rate of 2,000 gallons per hour.

THE SAN SEBASTIAN NITRATE COMPANY, LIMITED.—The first annual general meeting of the San Sebastian Nitrate Company, Limited, was held last week at Winchester House, Old Broad-street, Mr. A. R. Robertson presiding. The chairman, in moving the adoption of the report, stated that the two principal requirements of their industry were a good market and a good, or even a fair price. The demand for nitrate had annually increased, and for the first five months of the current year the demand had beaten the record, the sales amounting to 545,000 tons, against 400,000 tons in the corresponding period of the previous year. The price obtained for the nitrate, however, could only be described as wretched. The visible supplies at the present time amounted to 250,000 tons, against 280,000 tons at the same date last year. The latest accounts from their two nitrate establishments were satisfactory, and it was hoped that the cost of production would be less in the future. With their large output, a difference in the price of £1. or £1. 10s. a ton would materially affect them, and if they could obtain £9. or £9. 10s. a ton they would do extremely well. Mr. G. Bush seconded the motion, which was adopted.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

JOSEPH AIRD, GREATBRIDGE.—Iron tubes and coils of all kinds.

ASHMORE, BENSON, PEASE AND CO., STOCKTON-ON-TEES.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

BLACKMAN VENTILATING CO., LONDON.—Fans, Air Propellers, Ventilating Machinery.

GEO. G. BLACKWELL, LIVERPOOL.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

BRACHER AND CO., WINCANTON.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

BRUNNER, MOND AND CO., NORTHWICH.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

BUCKLEY BRICK AND TILE CO., BUCKLEY.—Fireclay ware of all kinds—Slabs, Blocks, Bricks, Tiles, "Metalline," &c.

CHADDERTON IRON WORKS CO., CHADDERTON.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. CLAY, EDINBURGH.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

CLAYTON ANILINE CO., CLAYTON.—Aniline Colours, Aniline Salts Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. CORTON, NEWCASTLE-ON-TYNE.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. DAGLISH AND CO., ST. HELENS.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

DAVIS BROS., MANCHESTER.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. DEMPSTER, MANCHESTER.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

DOULTON AND CO., LAMBETH.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. FAHRIG, PLAISTOW, ESSEX.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

GALLOWAYS, LIMITED, MANCHESTER.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

GRIMSHAW BROS., LIMITED, CLAYTON.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

JEWSBURY AND BROWN, MANCHESTER.—Samples of Aerated Waters.

JOSEPH KERSHAW AND CO., HOLLINWOOD.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. LINDSAY AND CO., CLAYTON.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

CHAS. LOWE AND CO., REDDISH.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

MANCHESTER ANILINE CO., MANCHESTER.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

MELDRUM BROS., MANCHESTER.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. MILNES AND BROTHER, BURY.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

MUSGRAVE AND CO., BELFAST.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

NEWCASTLE CHEMICAL WORKS COMPANY, LIMITED, NEWCASTLE-ON-TYNE.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

ROBINSON, COOKS, AND COMPANY, ST. HELENS.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. ROYLE, MANCHESTER.—Steam Reducing Valves.

A. SMITH, CLAYTON.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

WORTHINGTON PUMPING ENGINE COMPANY, LONDON.—Pumping Machinery. Speciality, their "Duplex" Pump.

JOSEPH WRIGHT AND COMPANY, TIPTON.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

Our Book Shelf.

Bench book for test tube work in Chemistry by H. T. Lilley, M.A., Assistant Master, Portsmouth Grammar School, London, Simpkin, Marshall, Hamilton, Kent, and Co. Second Edition.

This little pamphlet is intended as "a handy guide to practical work without diverting the attention by undue reference to details of manipulation," and so far as this, it will, no doubt, prove useful to elementary students.

We notice that in the table of solubility, the author gives calcium sulphate as soluble in water, instead of slightly soluble in water.

We also notice that "all salts of potassium sodium and ammonium are soluble in water." Surely this requires some qualification by naming the platino chlorides of potassium and ammonium, the hydric potassium tartrate (cream of tartar), and sodium antimoniate. The diligent student would, no doubt, discover this as he proceeds to the tests for potassium, ammonium and sodium, but it would be just as well to point it out to him beforehand.

The book is printed clearly, on thick paper suitable for the bench, and forms a handy laboratory companion.

FIRE-PROOFING.

THE "Gastechniker" refers to and summarizes articles by M. Victor Laporte, in "Le Monde de la Science et de l'Industrie," on the above important subject. The main methods of making structures fire-proof are two: (1) the use of incombustible material; (2) rendering material incombustible by means of a preservative coating.

Asbestos (meaning "incombustible") has been used from antiquity, it being on record that in classical times table-cloths were made of asbestos and cleaned in the fire, that lamp wicks were made of asbestos, and that asbestos cloth was used to wrap the bodies of the dead during cremation, so as to keep their ashes separate. Asbestos or amianth is a hydrated silicate of magnesia, white, green, or grey, fibrous silky, very near hornblende and augite; it can be spun and woven, though the fibres are rather too brittle to enable asbestos-cloth to be made cheaply. In France, the fireman's overclothes are here and there made of asbestos-cloth. In London, painting with asbestos has been introduced; the fire insurance offices regard it with favour. Experiments in the Champ de Mars, Paris, with inflammable buildings so painted, give useful results. Nagel has made incombustible paste of oxide of zinc and asbestos-powder rolled out on wire gauze and steeped, after drying, in a strong solution of chloride of zinc, and again rolled. This operation is repeated, and then the whole is well washed, so as to remove any acids and leave the resultant paste of asbestos and oxy-chloride of zinc firmly adherent to the wire gauze. These plates are flexible when wet, and may be rendered impervious by water-glass and casein, and may then be polished. Instead of chloride of zinc other metallic chlorides or sulphate of alumina may be used; instead of oxide of zinc may be used lime, magnesia, or gypsum. With these the plates may, for roofing, be rendered impervious by means of soap, which forms lime-soap or magnesia-soap. Nagel's plates, secured on wood, render it fire-proof.

Wendt Hérad uses a coloured surface-covering, consisting of colouring matter (oxide of lead, copper, or manganese) 15, linseed oil 12, silicate soda 50, asbestos talc and kaolin 15, water 8. They also use the following mixtures, which contain no asbestos:—(1) water 75¼, chloride ammonium 8, hyposulphite soda 2¼, sulphate ammonia 10, borax, 4½; (2) water 70½, hyposulphite soda 2½, sulphate potash 10, borax, 5, alum 12; the latter of these two being specially suitable for wood.

Rabitz uses, for making fire-proof walls and roofs, plates of wire gauze covered on one side with a mixture of lime, gypsum, and rough sand with cow-hair, in layers of from 1½ to 3 inches thick, according to the purpose. These dry in a few days, and can be painted, &c.

Tepper, Berlin, uses, for theatre scenes, a wire gauze with meshes of $\frac{1}{25}$ inch, covered with a hard-drying material on which the scene is painted. Such a curtain can be rolled up on a roller of 2 inches diameter, and weighs 1·34 lb. per square yard; its price is just a little above that of canvas rendered incombustible.

Water glass solution; a casein-solution obtained by rubbing together three parts of quicklime and two parts of curds, and coloured with mineral colours not affectable by sulphur; a mixture, much used in America, called "Asbestin," and consisting of asbestos, powdered silica, caustic potash, and silicate of soda, mixed for use with sand; a solution of common salt and alum; a solution of water-glass and tungstate of soda: such are the principal protective coverings.

Gasworks ammonia liquor, diluted with water, has high fire-extinguishing powers, but unfortunately, when so used, it evolves ...ing vapours.—*Gas World.*

AN APPLIANCE FOR PIPE-LAYING IN SOFT GROUND.

HERR JOHANN FRIEDRICH FISCHER, of Worms, has patented a method of, and apparatus for, pipe-laying in marshy or swampy ground, during inundations or in other similar circumstances, and for forming foundations in wet ground. In laying a line of pipes in accordance with this system, a trench is excavated to the water level with a wide bearing on each side for laying the sleepers and rails, on which the machines have to travel. As soon as the trench is ready, a line of pipes is put together and made tight. The next stage is to erect a sinking-frame or caisson, constructed of sheet iron with angle-iron frame and stays, open at top and bottom, and placed above the connected line of pipes, which are suspended in slings. The line of pipe is covered at each end with porous caps, which permit the water to enter, but not the dirt and soil. The pipe and the sinking-frame are then lowered by digging away the ground from under them, and when the proper depth has been reached and the end of the pipe joined on to the portion previously laid, the sinking frame is withdrawn by hydraulic power. The caisson is made in sections; so that, while the rest is taken up, the portion covering the pipe ends may be left, if so desired, until the joint is made. Herr Fischer prefers to make the joints with india-rubber rings on a spigot, which would allow for any slight irregularity of the ground. The invention has nothing to do with the freeing of the trenches from water, but merely suggests a way for substituting iron framing to keep a trench open, instead of the timbering usually employed for this purpose.

GLUE AND GELATINE.

COMMON glue is prepared from the trimmings of hides and the refuse of slaughter-houses and tanneries. The skins are cleaned and steeped in lime water, and afterwards exposed to the air for some days. They are then boiled in water, and the resulting liquid run off and allowed to settle, after which it is left to cool and gelatinize in shallow boxes. The resulting cakes of soft glue are then dried on nets in large buildings, provided with movable blinds, so that the air can freely circulate through them in pleasant weather, while during storms the glue can be protected from the weather. This process of drying requires great care, as a rise in the temperature may cause the partially dried glue to liquefy, making a "mess" which requires much labour to clear up, to say nothing of the loss or damage to the stock. It was formerly supposed that glue could only be dried at temperatures above the freezing point, but it was accidentally discovered that frozen glue was of equally good quality, and the manufacture is now carried on all the year round.

Cooking gelatine is practically made by the same process, but much greater care is taken in selecting the stock, and the utmost cleanliness is necessary in all the processes. It forms a healthful and attractive article of diet, but its nutritive value is not very great.

HOW TO USE GLUE.

All the glue as received from the factory requires the addition of water before it will melt properly, and every addition of water (while the glue is fresh made) will, up to a certain point, increase the adhesiveness and elasticity; and it is the duty of every man who uses glue to find out just where the point lies, as it is possible to melt glue and have it so thick that after it is dry or set, it will be so brittle as not to adhere to the wood. Some glues will bear more water than others, but all will bear more than usually falls to their share, and that, too, with a greater increase in the quality of the work. For glue to be properly effective it requires to penetrate the pores of the wood, and the more a body of glue penetrates the wood the more substantial a joint will remain. Glue that takes the longest to dry is to be preferred to glues that dry quickly, the slo w-drying glues being always the strongest, other things being equal. For general use, no method gives such good results as the following: Break the glue up small, put into an iron kettle, cover the glue with water, and allow it to soak twelve hours; after soaking boil until done. Then pour it into an airtight box; leave the cover off until cold; then cover up tight. As glue is required, cut a portion and melt it in the usual way. Expose no more of the made glue to the atmosphere for any length of time than is necessary, as the atmosphere is very destructive to made glue. Never heat made glue in a pot that is subjected to the direct heat of the lamp. All such methods of heating glue cannot be condemned in terms too severe. Do not use thick glue for joints or veneering. In all cases work it well into the wood in a similar manner to what painters do with paint. Glue both surfaces of your work, excepting in the case of veneering. Never glue upon hot wood, or use hot coals to veneer with, as the hot wood will absorb all the water in the glue too suddenly, and leave only a very small residue, with no adhesive power in it.—*Oil and Colourman's Journ.*

A GERMAN SUBSTITUTE FOR SCOTCH PIG.

MR. Jungst has conducted a series of experiments in the Gleiwitzer foundry in Upper Silesia, mainly with a view to produce a cheap material and thus emancipate the Continental foundries from their present dependence on English and Scotch iron. The Scotch pig owes, according to Gautier, its prominent qualities exclusively to its richness in silicon. He further maintains that the superfluous graphite in grey pig, produced at a high temperature, is eliminated by adding ferro-silicon to the latter, and that grey pig obtained by adding silicon to white pig, becomes denser and more homogeneous than natural grey iron in consequence of the elimination of graphite. Silicon decarbonises iron that contains manganese with greater difficulty than iron free from manganese; sulphur influences but little the formation of graphite, but opposes somewhat the decarburising property of silicon. Mr. Jungst found the statements of Turner, Lebedur, Wood, and Gautier relating to the effect of silicon on cast iron to be generally correct. His experiments show that silicon adds to the density and strength of cast iron, and that ferro-silicon can be applied with advantage and without difficulty whenever the chemical composition of the material is approximately known. The suitable texture of the material can be obtained by remelting grey pig or by adding ferro-silicon. The German process of fusing together grey irons in order to produce castings of great strength is thus proved to be incorrect, although at the present high price of ferro-silicon it is still advantageous to employ grey pig iron for casting of only ordinary quality. As to the most economical quantity of silicon in the ferro-manganese, 10·38 per cent. proved to be the best; at 5·32 per cent. the strength was great, but the product in other respects rather poor, probably because the necessary quantity of free silicon necessitated the presence of a great deal of manganese in the ferro-silicon. Manganese and phosphorus up to 1 per cent., and sulphur up to 0·16 per cent., had no injurious effect.—*Berg and Huttenweisen Zeitung.*

THE MANUFACTURE OF GLUCOSE.

THE process of making glucose will be best understood by following the corn from which it is made from the time it enters the factory until it runs out of the spigot, a clear, odourless liquid. The shell-corn is first soaked for several days in water to soften the hull and prepare it for the cracking process. The softened corn is conveyed by elevators to one of the highest storeys of the factory, and shovelled into large hoppers, from which it passes into mills that merely crack the grains without reducing them at once to a fine meal. The cracked grain is then conducted to a large tank filled with rinsing water. The hulls of the corn float at the top of the water, the germs sink to the bottom, and the portions of the grain, becoming gradually reduced to flour by friction, are held in solution in the water. By an ingenious process both the hulls and the germs are removed, and the flour part now held in solution contains nothing but starch and gluten. This liquid is then made to flow over a series of tables, representing several acres in area, and the difference in the specific gravity of the two substances causes the gluten and the starch to separate without the use of chemicals. The gluten is of a golden yellow colour, and the starch snow white. By the time the gluten has been completely eliminated the starch assumes a plastic form, and is collected from the separating tables by wheel-barrowfuls and taken to a drying room, where it is prepared as the starch of commerce, or is placed in a chemical apparatus to be converted into glucose. The conversion is effected by submitting the starch to the action of a minute percentage of dilute sulphuric acid, which, without becoming a constituent part of the compound, produces by its presence merely a miraculous change. This change from starch to glucose is a gradual process, and has four or five well defined stages. On the addition of the acid the first change results in the production of what is known to chemists as dextrine. If at this stage the acid is neutralized by the addition of lime water the process is checked, and dextrine is the permanent product. If the process is allowed to go on, the acid, however, works a second change, and maltose is the result. Here, also, the process can, if necessary, be interrupted by neutralizing the acid by means of lime water, and for some processes in the art of brewing this is sometimes done. The third and important stage in the chemical change wrought by the action results in the production of glucose, and just here is where the greatest skill of the chemist is required. The product must show by tests that it responds to the chemical formula, $C_6H_{12}O_6$. By comparing the formula with that of starch, which is $C_6H_{10}O_5$—that is, 6 parts of carbon to 10 of hydrogen and 5 of oxygen—it will be seen that the sulphuric acid has not added to the starch, but has taken up two parts of hydrogen, and the only gain in the starch is one part of oxygen.

The lime water introduced to neutralize the acid forms with it a product called gypsum—sulphate of lime—which can be removed from the glucose without leaving any appreciable trace. The fourth stage in the chemical process results in crystallizing the liquid, and then the product is called grape sugar. There is a fifth stage, in which caramel, or burnt sugar, could be produced were it of any commercial value. The gypsum, or sulphate of lime, formed by the neutralizing lime water and sulphuric acid, sinks by gravitation to the bottom of the vessel, and the supernatant saccharine liquid is drawn off from the top. This is almost pure chemical glucose, but it is still subjected to a filtering process through bone-black, and refined in the same way as cane sugar is refined. The bone-black has anything but the appearance of a purifying agent, but possesses the peculiar property of attracting to itself all colouring matter. The glucose, passing through a labyrinthine system of filtering, is drawn off through spigots in the lower part of the building, and is ready to be shipped away in barrels. To give the glucose the appearance of cane syrup, as well as to impart some of the characteristic taste, a small amount of that syrup is added to suit the fancy of buyers. To make grape sugar, the glucose is dried in rapidly revolving vessels, from which much of the moisture escapes by virtue of the centrifugal force. Neither the glucose nor the grape sugar is used for domestic purposes, although either one is about two-thirds as sweet as the sweetest cane sugar. Glucose is largely used by makers of cheap candies, but chiefly for fermenting purposes, and of late years has become valuable to the brewer in making beer and pale ales. It is also largely used in mixtures with cane syrups and molasses, and is esteemed by those who are best capable of forming an opinion on the subject as being more wholesome than the cane product, which is, at least, only a side product or residue in the manufacture of sugar.—*Kuhlow.*

THE PLATE GLASS INDUSTRY IN THE UNITED STATES.

THE growth of the plate glass industry in this country has been such that one is forced to regard its manufacture as one of the most prosperous industries in the United States. It is a question, however, one which time alone can answer, whether it will continue to be such a prosperous industry, rise being given to the question by reason of the large increase of capacity projected. There are already eight great works in operation, viz.: Crystal City, Duquesne, Creighton, Tarentum, Ford City, New Albany, Kokomo and Butler, capable of making from 9,000,000 to 10,000,000 square feet of glass per annum, according to recent estimates, or almost as much as the present requirements of the country call for. What, then, is to become of the heavy additional production promised is not known, without lower prices for the article can greatly augment consumption. But work on new plants and additions to old ones is going on just the same, nevertheless. At Charleroi, the newest industrial city of Pennsylvania, a huge plate glass establishment is being erected, and will be equipped with glass machinery, at a contract cost of $308,000. The Diamond Plate Glass Company, of Kokomo, Ind., through a branch $2,000,000 incorporation, is putting up a works at Elwood, Ind., to make 20,000 feet of finished glass a day, and to give employment to about 2,500 men. The Pittsburgh Plate Glass Company propose doubling their present plant at Ford City, at an outlay of $1,750,000, so as to surpass all competitors in the matter of output, at home or abroad. Other companies still are enlarging, and entirely new enterprises of the kind are being either actually organized or talked of in various parts of the country.—*Wheeling Manufacturer.*

MANGANESE.

A NEW mode of preparing manganese, by which the metal can be obtained in a few minutes in tolerably large quantities, and almost perfectly pure, is described by Dr. Glatzel, of Breslau, in the current number of the Berichte. A quantity of manganous chloride is dehydrated by ignition in a porcelain dish, and the pulverized anhydrous salt afterwards intimately mixed with twice its weight of well-dried potassium chloride. The mixture is then closely packed into a hessian crucible, and fused in a furnace at the lowest possible temperature, not sufficient to volatilize either of the chlorides. A quantity of metallic magnesium is then introduced in small portions at a time, the total quantity necessary being about a sixth of the weight of the manganous chloride employed. Provided that the crucible has not been heated too much above the melting point of the mixture of chlorides, the action is regular, the magnesium dissolving with merely a slight hissing. If, however, the mixture has been heated till vapors have begun to make their appearance, the reaction is extremely violent. It is, therefore, best to allow the contents of the crucible after fusion, to cool down to a low, red heat, when the introduction of the magnesium is perfectly safe. When all the action has ceased, the contents of the crucible are again heated strongly, and afterwards allowed to cool until the furnace has become quite cold. On breaking the cru-

cible, all the potassium chloride is found to have been volatilized, leaving a regulus of metallic manganese, fused together in a solid block, about three parts by weight being obtained for every two parts of magnesium added. The metal, as thus obtained, is readily broken up, by hammering into fragments of a whitish-gray colour, possessing a bright metallic lustre. The lustre may be preserved for months in stoppered glass vessels; but when exposed to air, the fresh surface becomes rapidly brown. The metal is so hard, that the best files are incapable of making any impression upon it. It is so feebly magnetic, that a powerful horse-shoe magnet capable of readily lifting a kilogramme of iron, has no appreciable effect upon the smallest fragment. It was noticed that the introduction of a small quantity of silica rendered the manganese still more brittle, and caused it to present a conchoidal fracture, that of pure manganese being uneven. The specific gravity of the metal, former determinations of which have been very varied, was found to be 7·3921 at 22° C. This number, which was obtained with a very pure preparation, is about the mean of the previous determinations. Dilute mineral acids readily dissolve the pulverised metal leaving a mere trace of insoluble impurity. It is also satisfactory that practically, no magnesium is retained alloyed with the manganese and the introduction of carbon is altogether avoided by the use of this convenient method.—*Kuhlow.*

TIN PRODUCING IN MALACCA.

IN an article on "Tin in its Native Land" the popular *Science Monthly* for June, has the following interesting notes relative to the method of extracting the tin from the ore followed in the Malacca Peninsula:

It did not take long to witness the extremely simple process by which the ore is extracted. After clearing off the ground, the surface and subsoil are removed for one, two, or three metres, till the mineral, tin-bearing bed, is exposed; this is sometimes several metres thick. The mineral is carried in baskets up the cocoa-trunk ladders, to a wooden flume which is washed by a current of water. As the mine grows deeper this labour, with the rudimentary means at the disposition of the Chinese, is made extremely difficult by the inflow of water. The washing of the tin-bearing earth is done by coolies, who with a rake remove the stones and work up the material in such a way as to eliminate the light sands that are mixed with oxide of tin, till only 25 or 35 per cent. of foreign matter is left. The mineral thus enriched is melted in little brick furnaces, with the aid of a bellows of bamboo, which is worked by a coolie as if it were a syringe. The white metal as it runs out, is cast into the well-known cubic ingots with one side flaring over the edges, so as to give them a pair of ears by which they can be more easily handled. A great deal of metal is certainly wasted in this process; and a second washing of the refuse would probably be very remunerative. The Chinese and Malays call this lost metal young tin, which is returned to the earth to ripen, because it is not yet old enough to stay in their primitive machines. It is only now, after no one can tell how many centuries since tin has been known and worked in the peninsula, that a rational system of operating the mines is about to be adopted.—*American Manufacturer.*

Trade Notes.

The Birmingham Oxygen Company, Limited.—The Birmingham Oxygen Company, Limited, is announced, with a capital of £50,000. in £5. shares, of which 9,000 are A and 1,000 B shares, the latter not being entitled to rank for dividend until the A shares have out of the profit of each year received a dividend of 5 per cent. A first issue is now announced of 4,000 A shares. The company has been formed to acquire the exclusive right to manufacture and sell oxygen and other gases in portable vessels, according to a patented process, within a radius of from 40 to 45 miles of the Town Hall of Birmingham.

Alizarine Blue.—When alizarine blue enters into the dye mixture, in order to obtain even shades, it is important to heat with great care when the temperature gets to 140° F. and from that to 180°, for it is principally between these temperatures that the blue is fixed. It is also recommended that about one-thousandth part of ordinary acetic acid should be added to the water, for in the case of calcareous waters there is a tendency to form a lime lake with the blue, which deposits somewhat superficially and causes a loss of brightness and the cloth to rub off blue when dry. In waters which contain much carbonate of lime (and the same may be said of carbonate of magnesia), it may be necessary to use a larger amount of acetic acid, and it is desirable that the proper quantity to be used should be determined by careful experiments or by chemical analysis. This applies to mordanting operations as well as to dyeing.

Phosphates in Algeria.—Deposits of phosphate of lime have been discovered in the West of Oran, but the distance from the sea is great, and there are no good roads. It is therefore unlikely that they will be turned to good account for a good many years yet. There are other deposits near Souk Ahras, in the department of Constantine, but these have not been much utilised hitherto, as the colonists have not yet learnt the value of chemical manures.

Contemplated Stoppage of Iron Works in South Wales.—The furnaces of the Forest Iron and Steel Works, Pontypridd, will in all probability be blown out at the end of this week. From 250 to 300 men are employed there. The step now taken by the directorate of the steel works is attributed mainly to the fact that the price of the manufactured article has reached an unremunerative point. It is satisfactory to learn, however, that in all probability the stoppage will be but a temporary one. The market is already assuming a steadier tone, and strong hopes are entertained that the works will be reopened in a few months. Meanwhile the furnaces will be relined.

The Clerkenwell Analyst's Salary.—The vestry of Clerkenwell, with all their faults, cannot be accused of extravagance in the matter of salaries to their officials. They are now engaged in a heated warfare over what some consider the just earnings of their clerks in the recent quinquennial re-valuations; and at their meeting a few nights since they discussed the salary of their newly-appointed public analyst (Mr. J. K. Colwell). This gentleman was appointed by the vestry in the early part of May, but because the official ratification of the appointment did not come from the Local Government Board until June 14, the vestry have declared that they will only pay since the latter date. On this basis of argument had the official note been three months in coming (which is not unusual with the Local Government Board), the analyst would have lost a quarter's salary. The vestry took advantage of the fact that no samples had been submitted for analysis between May 10 and June 14.

Novelties in Advertising.—In newly-opened showrooms at 52, Queen Victoria-street, E.C., a number of novel and interesting advertising mediums are being exhibited by Messrs. F. W. Oliver and Co., Limited. The design is first of all printed by an ingenious process on an iron sheet or tablet, which is then embossed and enamelled with an elastic unbreakable enamel. The advantages claimed are that any design, however elaborate, can be faithfully reproduced, that the embossing emboldens the printing, and that the enamel, which neither chips nor cracks, but yields with the iron, renders the tablet more durable and permanent. The system of printing is applied also to other mediums, to specially prepared canvas, and to glass. The fact that tablets printed in this way, though exposed to the severest weather and subjected to the roughest usage, are practically indestructible, is one which should engage the attention of all extensive advertisers, and ensure for the invention a successful future.

Oil of Sassafras in America.—The manufacture of the oil of sassafras has become an important industry in some parts of America, especially in the Southern States, where this tree is common. Only the roots are used; they are chopped up into small pieces by a machine constructed for the purpose, the oil being then distilled from the chips by the aid of steam. About one gallon of the oil, weighing nine pounds, is obtained from 1,000 pounds of the chips. The uses for which the oil of sassafras can be employed are numerous and varied. It is a much used perfume for soaps and candles; it is used as a solvent for different gums, and as a liniment. It is also very largely employed in the manufacture of several popular proprietary medicines. The importance of this industry may be expected to increase rather than diminish, as the sassafras and the persimmon are the two trees which are spreading most rapidly over the old and abandoned fields throughout the Southern States outside of the pine belt proper; and at present prices good wages can be made digging out the roots.

Effects of the Competition of Russia on the Petroleum Trade.—The keen competition of Russian oil with the American oil in foreign markets is seen by the returns of the export trade of the United States. During the ten months ended April 30, the exports of petroleum from the United States amounted to 542,277,621 gallons, of the value of £8,409,461. In the same months of the previous year the exports of petroleum amounted to 504,353,090 gallons, valued at £8,234,086. In order to increase the exportation in competition with Russian oil, it was necessary to reduce the price. The exports of illuminating oil from the United States during the last ten months amounted to 426,616,813 gallons, valued at £6,265,789. But in the same ten months of the previous year the exports of illuminating oil, amounting to 407,878,689 gallons, had a value of £6,451,922. It is said the owners of the Russian oil wells will in a short time award to an American firm the contract for the building of a pipe line 497 miles long, to run from the oil wells at Baku, on the Caspian, to Batoum, on the Black Sea, the loading port. The pipes will be of cast iron, 8 in. in diameter, and there will be sixty-four intermediate stations. It is surmised that the success of the proposed line will prove prejudicial to the exporting interests of American producers.

BASIC IRON.—The South Tredegar Iron Company, of Chattanooga, Tenn., made some basic iron during 1889, and have furnished the *Bulletin* with the following information as to how it was made:—"Basic Iron is iron which has been desiliconised in a Bessemer converter, and dephosphorised on a second lining in a Danks or other form of furnace, on the lines of the inventions and discoveries of Dr. L. D. Chapin, of Chicago, Ill. We take the high phosphoric pig iron of the South, high also in silicon, melt it in a cupola, thence pass it through the converter, with a shorter blow than for Bessemer steel, and thence run it into gas-heated puddling furnaces, where it is "balled," and is then ready to be squeezed or hammered. We prefer the hammer. We are able without difficulty to handle charges inside of an hour from cupola to muck bar, removing as much of the silicon and carbon as we care to, and also removing over 97 per cent. of the phosphorus, and at a most reasonable cost. You will at once see that this settles the steel business from Southern pig iron, as we can readily and cheaply deliver strictly neutral blooms or muck bar to the steel makers in any desired quantities. We are the only parties having any sub-license so far, but we understand that the holder of the license for some twenty-five States, John F. Haskins, M.E., now of Chattanooga, Tenn., is negotiating with others for its adoption. We are only fairly started with the process, but see no reason to regret having taken it up."

THE INTERNATIONAL OKONITE COMPANY.—The International Okonite Company announce the issue of 17,000 preference shares, a similar number of ordinary shares, and 1,000 debentures, which will be issued simultaneously in London and New York. The company has been formed to acquire the business of the Okonite Company of New York, and to extend the same to the United Kingdom and all parts of the world. The remarkable and rapid progress of that company has placed it among the most solid industrial undertakings of America. For the purpose of extending the manufacture of okonite wires in this country the well-known wire and cable works of Messrs. Shaw and Connolly, of Newton Heath, Manchester, have been also acquired. The two businesses will be taken over as going concerns from 1st January, 1890, from which date the profits made will be for the benefit of this company. The business now carried on by the Okonite Company of New York consists in the manufacture of okonite-covered wires and cables, which are applicable for telegraph, telephone, electric light, and other purposes, whether for aerial, submarine, or underground uses. This wire is covered with a valuable compound known as okonite, prepared and applied by special processes. The Okonite Company claim that their products have been found by ever-increasing use to possess many advantages over wire covered in the ordinary manner, including that of being produced at less cost than the best qualities made by other processes. It is further claimed by the Okonite Company that the wires and cables manufactured by them possess superiority of insulation, durability, toughness, and resistance to the decomposing influence of the elements, which have so destructive an effect upon most insulated wires after exposure and use; that they stand a higher test for insulation than any other practical medium used for this purpose; and that they are not susceptible to deterioration from extreme heat or cold.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

There has been a strong demand for caustic soda, and prices during the week have hardened all round. Makers are now very well filled with orders, and prices on the spot are for 74%, £9. 10s.; 70%, £8. 15s. to £8. 17s 6d.; 60%, £7. 17s. 6d. per ton, all f.o.b. Liverpool. There is also considerable enquiry for deliveries forward over 1891, and the same enquiry is extending to the other products of the alkali trade, in consequence of the favourable progress of negotiations for the formation of the syndicate. The general belief now exists in the trade that the proposed union of the works will be accomplished, and in view of this probability, makers are declining to undertake engagements for supply of goods beyond September 30. Bleaching powder on the spot is dull, and business done at £4. 12s. 6d. per ton on rails; £5. to £5. 2s. 6d. per ton (hardwood), f.o.b. Liverpool. Soda ash is somewhat irregular in price, according to brand, but the market on the whole is easier, and current value may be taken as 1¼d. to 1⅜d. per degree for good ordinary. Carb ash, 48% to 58%. Soda crystals are very quiet, and price drooping, £2. 15s. on rails being nominal quotations. Chlorate of potash flat, and remains at 4½d. per lb. for early delivery. Muriatic acid, 7d. to 8d. per carboy at works. Sulphur in all grades is well sold, and price for best recovered lump is £4. 2s. 6d. to £4. 5s., in bulk. Saltcake, 27s per ton. Vitriol, steady at 24s. 6d. to 26s. 6d. per ton for brown 145°. The demand for sulphate of copper has fallen off considerably, and ruling quotations are £22. per ton at usual points. The market for the metal is firm, and the make of sulphate is likely to be reduced for a time. Lead salts continue quiet, but prices are firm. Tin crystals are selling at 6¾d. per lb. Acetates of lime are neglected, and prices have a downward tendency, brown at £7. 7s. 6d.; grey, £12. 15s. per ton. Acetate of soda remains steady at £15. 15s. to £16. c.i.f. Sugar of lead, £24. c.i.f. Potash caustic and carbonate are in good demand, and stocks are light. Carbolic acid, crude, and crystal are without material change in position and transactions are unimportant.

THE METAL MARKETS.

WEDNESDAY.

LONDON.

IRON.—The continued decrease in stocks, and a better demand has caused warrants to be slightly firmer. Manufactured iron is also a more steady market. Scotch pig iron 45s. 8½d. cash and 45s. 11d., one month.

COPPER.—Statistics for the month show a decrease in stock of nearly 10,000 tons, but price of bars has relapsed on rumours of imports from America. The market was quiet and weaker at £57. cash, and £57. 15s., three months.

TIN.—Monthly figures show an increase of 1,200 tons in London stock, and price of foreign relapsed to £93., cash, £93. 5s., 14 days, and £93. 15s., three months, closing rather quiet thereat. English ingots, £97. to £97. 10s.

TIN-PLATES.—Firmer, but with little doing, the production continues large, but the stocks at outputs show a decrease.

LEAD.—English, £13. 5s., Spanish, £13. 7s. 6d. to £13. 10s.

COPPER shares were dull, Rio Tinto falling ¼ to 23⅛, and Mason and Barry ⅛ to 8.

GLASGOW.

WEDNESDAY.—Market steady, with a fair business. Scotch done at 45s. 11½d., 45s. 10d., and 45s. 10½d. cash, also at 46s. 1d., 45s. 11½d, and 46s. 0½d. one month, closing buyers at 45s. 10½d., cash, sellers ask ½d. more. Middlesbrough done at 43s. 3d. cash; closing buyers at 43s. 3d. cash, sellers ask 43s. 4d. Hematite closes with buyers at 51s. 10½d. cash, sellers ask 52s.

WOLVERHAMPTON.

WEDNESDAY.—The Staffordshire iron trade is improving. Inquiries on 'Change to-day were more numerous both for manufactured and crude iron. Marked bar makers who have lately quoted £9. 10s. will accept lower rates, and an official reduction of £1. is expected in this description next week to bring them nearer to unmarked iron. Common bars are quoted firm at £7.; sheets are less weak; slit rods are quoted £7. for short weight, and 10s. more for long weight. Pigs firmer, common sorts 37s. 6d. to 40s.

TAR AND AMMONIA PRODUCTS.

The Tar Products market remains without variation, though there seems a tendency to increasing firmness in most products, and prices quoted for last week hold good for to-day.

The Sulphate of Ammonia market has a very steady tone, and there is a very good enquiry for America; the general demand being better, and the market has been fairly well cleared of spot parcels. Buyers are now willing to pay £11. 6s. 3d. at any of the ports, and if makers remain firm better prices will be obtained presently. The advance in Beckton prices will, if maintained, add to the firmness of the position. To-day's quotations may be stated as £11. 10s. Beckton, £11. 5s. outside London makes, £11. 6s. 3d. at Leith, and £11. 7s. 6d. Hull.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There is very little change to report in the chemical market this week, with the exception of caustic soda, which has again been advanced ten shillings per ton. Other articles are practically the same as last reported. There is a good deal of inquiry for forward business, but makers will not sell ahead in the present state of affairs.

Current quotations are as follows:—Bleaching powder, in softwood casks, £4. 15s. per ton; caustic soda, 77%, £10. per ton; ground and packed in 3-4 cwt. barrels, £13. per ton; soda ash, 48/52%, 1¼d. per degree, less 5%; soda crystals, £2. 10s. 6d. per ton, in casks,

gross weight; £2. 10s. 6d. per ton, in 2 cwt. bags, net weight; and £2. 13s per ton, in 1 cwt. bags, net weight; sulphate of soda, in bulk, 32s. per ton; ground and packed in casks, 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 4½d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £5. 15s. per ton; in 5-7 cwt. casks. £5. 5s. per ton; pure white sulphate of alumina, £4 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

There is considerable easiness in the price of small coals this week, owing to a plentiful supply and lessened demand. Quotations range from 6s. to 6s. 6d. per ton, according to quality.

REPORT ON MANURE MATERIAL.

The half year closes without much business doing but at firm prices for both phosphatic and nitrogenous manure material.

Nitrate of Soda.—During the past six months the most striking feature in the trade has been the continued low range in prices for nitrate of soda, the market opening in January at 8s. 6d. on spot, going down to 7s. 10½d. in March, and closing in June at 8s. 1½d. for ordinary quality. These low prices have induced a very largely increased world's consumption—fully 150,000 tons over that during first half of 1889—and have left the visible supply at the end of June some 40,000 tons less than that at same date in 1889. Unless, therefore, the shipments during the coming months are unprecedentedly large, of which there is at present no indication, some material advance in price may be looked for as the year progresses. Due cargoes of ordinary quality are worth 8s., May/June shipments, 8s. 2d. to 8s. 3d.; July/August, 8s. 4½d. to 8s. 6d.; and September/October, 8s. 6d. to 8s. 7½d.; 3d. to 6d. per cwt. more being required for refined.

Guano.—The imports to Europe of Peruvian have been larger than for some years past, but prices preclude a very free use of this article in the U.K. The bulk of Liebig's and other River Plate guanos has gone to the Continent and the United States, better prices being obtainable there, and it seems likely that the production will for the most part again go to those markets, there being buyers there at about 11s. 6d. per unit of ammonia, and 1s. 4d. per unit of phosphate of lime, prices which U.K. buyers do not seem inclined to pay.

Other Nitrogenous Material.—There have been no important importations of fish guano, and consequently the home production has met with a ready sale at full prices. Present value may be quoted as 10s. 6d. per unit of ammonia, and 1s. 3d. per unit of phosphate of lime, free rails or free on board at works. The home production of dried blood has been about on the usual scale, but the imports have been small. Prices, however, early in the year, were such as to compel manure manufacturers to substitute other material, and the value in consequence fell from 11s. 6d. per unit of ammonia in January, to about 10s. over the spring months, the closing values being about 10s. 3d. per unit for River Plate and 10s 6d. for home production. With the export demand now to be expected some advance in prices will probably be required, and it may be well for home buyers to be covering their requirements as they have opportunity. Ground hoof and horn (ammonite) does not offer very freely, the raw material being dear, but it can be bought at 9s. 6d. per unit of ammonia, delivered free to rails at works—probably at 9s.

Mineral Phosphates.—The chief points to be noted are the new source of supply in Florida, the falling off in the production of Somme, and the rapidly increasing consumption of mineral phosphates on the Continent. With regard to the first point, it seems certain that the Florida deposits cannot be sufficiently developed and transit arrangements to seaboard sufficiently completed for this rock to come into general use within the next twelve months. The increasing consumption of phosphates on the Continent is making itself felt, as is also the rapid falling off in the production of Somme. So that in the meantime any alteration in prices of Charleston and similar grade phosphates is likely to be in an upward direction rather than the reverse. During the early months of the year 11d. per unit was freely paid for Bull River rock in cargoes c.i.f. to U.K. Subsequently, when Florida rock became much talked about, buyers began to hold back. More recently, shippers of Charleston, favoured by easier freights, have accepted 10½d. for River and 9½d. for Land rock, but at the close they seem disposed to require more money, and if they hold out they will probably get it. The attitude of shippers of Continental phosphates is much the same. The present quotations are:—For Somme, 55/60% 9¾d., 60/65% 11d., 65/70% 12¾d., 70/75% 1s. 3d., with one-fifth rise in each case, c.f. and i. in bulk in cargoes to good U.K. ports; Osso, dried and unground, 52/57%, 11½d. per unit, in bulk, c.f. and i. to U.K.; dried and ground, 55 60%, 1s., c.f. and i. to U.K. ports; Belgian, 40/45%, 7d. to 8d. per unit, according to port, c.f. and i.; 48/53% 10¼d. per unit; Canadian, 70/75% is worth about 1s. 0½d., 75/80% 1s. 2d., 80/85% 1s. 3½d., one-fifth rise, ex ship Thames, Mersey, or Clyde; 60% may be had at 9¾d. per unit, and 65% at 11d.—perhaps less.

Bones and Bone Meal.—The increasing demand for the United States, in the absence of any fresh source of supply, has favoured the upward movement in prices during the past twelve months, in sympathy with mineral phosphates, and the present outlook does not point to a lower range of values during the coming season. The speculative movement in East India bones and meal enabled sellers of River Plate bones to realise as much as £5. 10s. and £5. 12s. 6d. in spring, but the most recent sales have been at £5. 7s. 6d. for cargoes due in off season, £5. 10s. now required. Considerable sales of crushed East India bones and bone meal have been made at, it is supposed, about £5. 7s. 6d. for bones, and £5. 12s. 6d. for meal direct U.K. port, but shippers do not seem inclined to commit themselves to further engagements under £5. 5s. for bones, and £5. 10s. for meal, ex quay Liverpool, to which port considerably easier freights can be obtained, and more frequent shipping opportunity. The Indian Exchange, too, stands in the way of lower prices, the rupee having advanced in value from 1s. 4½d. to 1s. 6½d. Spot value of Bombay bone meal is £5. 10s., ex store Liverpool. £4. 15s. would probably be accepted for common grinding bones, ex quay Liverpool, for shipment from the Mediterranean.

THE COPPER MARKET.

Messrs. Harrington & Co.'s copper report, dated Liverpool, 1st July, states:—Chili copper charters for second half of June are advised as 500 tons fine. No other quotations given. The total charters since 1st January have been 11,800 tons against 11,700 tons for same time last year. Business in G.M.B.'s has continued to be considerable; prices receded to £58. cash, and £58. 12s. 6d. three months, and recovered again to £59. 5s., and £59. 17s. 6d. respectively, but close to-day at £57. 15s. cash, and £58. 7s. 6d. forward. Swansea stock of Chili bars has again been increased from Havre stocks by 300 tons, making Swansea stock to-day 525 tons. The stock of English G.m.b.'s copper was on the 16th 5,286 tons, and to-day is 5,067 tons, showing a decrease of 229 tons, of which 114 tons are from Liverpool and 115 tons from Swansea. The stocks of Liverpool and Swansea therefore show a decrease of 121 tons. The total decrease in stocks is 8,528 tons for the month. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, about 16,406 tons fine copper against 16,297 tons 16th inst., price of cash bars £59. 7s. 6d., and against 28,520 tons 3rd July, 1889, price £41. 2s. 6d.

Stock of other copper contained in Matte G.M.B. foreign ore and Spanish precipitate, 17,161 tons fine against 17,391 tons 16th inst.

THE LIVERPOOL MINERAL MARKET.

The firmness reported in our market last week has been fully maintained. Manganese arrivals are smaller; prices, however, still continue firm. Magnesite freely offering, and prices totally in buyers' favour. Raw lump, 26s., raw ground £6. 10s., and calcined ground £10. to £11. Bauxite (Irish Hill Brand): The demand is very strong, bringing full prices. Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: There are fewer arrivals this week. The demand still continues brisk, and prices are well maintained, especially for G.G.B. "Angel White" brand, 95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate) more inquiry; selected crystal lump is scarce at £6.; No. 1 lumps, 96s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; and selected crystal ground, £8. Sulphate firm, and prices are better; best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.G.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumice-stone easier; ground at £10., and specially selected lump, finest quality, £13. Iron ore quieter. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 10s. to 12s. 6d. Purple ore quiet. Spanish manganiferous ore continues in fair demand. Emerystone: Best brands inquired for, and bring full prices. No. 1 lump is quoted £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal continue in fair demand. Chrome metal, 5s. 6d. per lb. Chrome ore offering more freely, and prices are easier. Antimony oxide, 24s. to 26s. Asbestos is in strong demand, especially rock; prices firmer. Potter's lead ore continues firm; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Best qualities are scarce—60s. to 80s. Strontia steady; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand, and

brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Bog ore in demand, firm, at 22s. to 25s. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10, French sand, in cargoes, continues scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel easier. Chrome iron unaltered at last quotations. Ground mica, £50. China clay freely offering—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn).

THE LIVERPOOL COLOUR MARKET.

Colours unaltered. Ochres: Oxfordshire quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc: V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Sulphate of ammonia, so long rather inert, has not made any movement to speak of during the week, but there is certainly improvement of a sort, and makers and holders are slowly hardening in their advance estimate of the market. To-day, buyers cannot supply their wants at less than £11. 3s. 9d.; but this partial stiffness hardly dates back further than yesterday, when it seems £11. 2s. 6d. was taken, although not looked at to-day, so far as ascertained business goes. There is little of change in the general market. Caustic soda fully holds its own with a further advance in the highest strength; bleaching powder has taken itself up slightly, and for local consumption is fetching a few shillings better value than a week ago, a development probably due in part to the talk about a new alkali departure which has been engaging attention in chemical circles here, as on the Tyne and in Lancashire. Manufacturers are more inclined just now to draw together for mutual protection than they were a year ago, when independent action and a free hand in market dealings were somewhat in vogue, theoretically at least. The old standing agreement between the Scotch makers of bichromates, thought by some to be in peril, will most likely, after all, come through the approaching readjustment crisis unimpaired. Chief prices current are:—Soda crystals, 51s. net, Tyne; alum in lump £5., less 2½% Glasgow; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; soda ash, 1¼d. less 5%, Tyne; caustic soda, white, 76°, £10. 2s. 6d., 70/72°, £8. 13s. 9d., 60/62°, £7. 12s. 6d., and cream, 60/62°, £7. 5s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s., and 1 cwt. casks, £6. net Tyne; refined alkali, 48/52°, 1½d., less 1¼%, Tyne; saltcake, 27s. to 28s.; bleaching powder, £4. 12s. 6d. to £4. 17s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 4d., and of soda, 3d., less 5 and 6% to Scotch and English buyers respectively; chlorate of potash, 4½d., less 5% any port; nitrate of soda 8s. 1½d. to 8s. 3d.; sulphate of ammonia, £11. 3s. 9d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £21., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3¼d.; paraffin spirit (naphtha), 7d. a gallon; paraffin oil (burning), 6¼d. to 7d. on rails Glasgow to all Scotch buyers (English orders negotiable about 1¼d a gallon lower); ditto (lubricating), 865°, £5. to £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's import of sugar at Greenock were 3,227 bags only.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

H. GASKELL, D. GAMBLE, S. HALL, H. GASKELL, Junr., E. CAREY, H. W. DEACON, J. B. GASKELL, and F. GASKELL, under the style of Gaskell, Deacon and Co., Widnes, alkali and chemical manufacturers, as far as regards D. Gamble and S. Hall.

S. B. HICKS and H. P. LEACH, under the style of Hicks & Co., Snow Hill, London, drysalters.

H. SHAW and J. RUTHERFORD, under the style of Henry Shaw & Co., Blackburn, brewers and maltsters.

New Companies.

FRONTENAC PHOSPHATE COMPANY, LIMITED.—This company was registered on the 21st inst., with a capital of £10,000., in £1 shares, to acquire phosphate and other lands and mines in Canada or elsewhere, and for such purpose to adopt an unregistered agreement of 23rd ult. with the Stirling Phosphate and Mining Company of Kingston, Limited, and with C. J. R. Stirling. The subscribers are:—

	Shares.
C. Curtis, Lonsdale-chambers, Chancery-lane, solicitor	1
T. S. Curtis, 20, Ridge-road, Hornsey, solicitor	1
W. B. Marshall, C.E., Richmond-hill, Birmingham	1
T. King Curtis, Brackley, Northampton, draper	1
G. Hensman, 25, College-hill, solicitor	1
P. E. Marshall, 25, College-hill, solicitor	1
A. M. Marshall, D.S., Owen's College, Manchester	1

INTERNATIONAL OKONITE COMPANY, LIMITED.—This company was registered on the 24th inst., with a capital of £340,000., divided into 17,000 ordinary and 17,000 preference shares of £10. each, to adopt an agreement (unregistered) with Woodhouse and Rawson United, Limited, and to manufacture and sell insulated and other wires and cables for telegraphic, telephonic, and other purposes. The subscribers are:—

	Shares.
F. Spooner, 83, Rendlesham-road, Lower Clapton, insurance agent	1
J. Beaumont, 9, Daneville-road, Camberwell, shorthand writer	1
H. E. Smith, 26, Park-place, Leyton	1
H. C. Newton, 121, Avenell-road, Highbury, shorthand writer	1
J. S. Standen, 60, Moray-road, N.	1
W. Dauny, 6, Lexham-gardens, W.	1
A. Stevens, 4, Trafalgar-square, agent	1

OLDBURY ALKALI COMPANY, LIMITED.—This company was registered on the 24th inst., with a capital of £360,000., in £100. shares, 1,600 of which are preference shares (non-cumulative 5 per cent.), to purchase, upon terms of an agreement of 21st inst., the business of alkali makers and chemical manufacturers, carried on by Chance Brothers, at Oldbury, Worcester. The consideration is the discharge of the debts and liabilities of the business up to 31st December, 1890, and the allotment of 1,600 fully-paid preference shares, and 2,000 ordinary shares credited with £87. 10s. as paid up on each. The subscribers are:—

	Shares.
R. L. Chance, Edgbaston, alkali manufacturer	1
J. H. Chance, Edgbaston, alkali manufacturer	1
Hy. Chance, Leamington, alkali manufacturer	1
A. M. Chance, Edgbaston, alkali manufacturer	1
G. F. Chance, Stourbridge, alkali manufacturer	1
J. F. Chance, 51, Prince's-gate, alkali manufacturer	1
R. L. Chance, Alcester, fire brick manufacturer	1

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Electric Switches. J. Drummond. 9,263. June 16.
Water-level Indicator. T. Janeway. 9,283. June 16.
Electric Switches. W. H. Scott and Lawrence Paris and Scott, Limited. 9,284. June 16.
Electric Motors. C. E. Nichols. 9,289. June 16.
Instrument for Testing Setting of Cements. C. J. Howe. 9,306. June 16.
Manufacture of Thin Sheets of Nitro-cellulose.—(Complete Specification.) E. N. Todd. 9,315. June 16.
Naphthalizing Gas. T. Travers. 9,320. June 16.
Dyeing. Read Holliday and Sons, Limited and T. Holliday. 9,322. June 17.
Vaporizers.—(Complete Specification). J. O. Woods. 9,326. June 17.
Electrolysis of Chlorides. W. H. Dowland and W. Mills. 9,330. June 17.
Brick-making Machinery. T. C. Fawcett. 9,337. June 17.
Recovering Salts from Solutions C. H. Huntley. 9,354. June 17.
Prevention of Steam Boiler Incrustation.—(Complete Specification). W. B. Bull. 9,379. June 17.
Charging Gas Retorts. J. C. Chandler. 9,394. June 17.
Apparatus for Steaming Fabrics or Fibres. T. Mellor. 9,430. June 18.
Fining Beer. L. C. Best. 9,442. June 19.
Aeration of Carbons in Filters. R. Gough. 9,456. June 18.
Evaporating Solutions. J. Foster. 9,518. June 19.
Gas-producers. J. C. Mewburn. 9,521. June 19.
Brick-making Machinery. C. Walton. 9,524. June 19.
Plates for Oil and other Presses. W. C. Leechman. 9,526. June 19.
Dyestuffs. J. Y. Johnson. 9,537. June 19.
Manufacture of Emulsions and other Materials sensative to Light. W. Rebikow. 9,538. June 19.
Gas Generator. C. Herzog. 9,539 June 19.
Regulatiug Quality of Gas. C. Herzog. 9,540. June 19.
Automatically Drawing off viscous substances.—(Complete Specification). L. H. A. W. Sack. 9,556. June 20.
Steam Boiler Furnaces. E. Binns and H. Collier. 9,581. June 20.
Smoke Consuming Furnace. S. Eggenberger. 9,611. June 20.
Apparatus for Humidifying Air. J. Moseey. 9,625. June 21.
Coal Washing Machinery. A. F. G. Brown. 9,632. June 21.
Manufacture of Coke. G. Horsley and A. C. Wilson. 9,642. June 21.
Treatment of Rhea and other Fibres. A. Hodge. 9,643. June 21.
Production of Fuel from Peat. W. Lowe and C. Gumbart. 9,651. June 21.
Pyroxyline Compounds. J. S. Fairfax. 9,660. June 21.
Packing Chloride of Lime.—(Complete Specification). J. C. Steele. 9,670. June 21.
Pulping Machines. Fredk. Randell, H. Randell, Frank Randell, and W. Brett. 9,675. June 21.
Dyestuffs. J. Y. Johnson. 9,676. June 21.
Recovery of Gold from Solutions. C. T. J. Vautin. 9,684. June 21.

IMPORTS OF CHEMICAL PRODUCTS

AT

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending June 21st.

Acetate Amyl—
Germany, £23. F. Stahlschmidt & Co.

Antimony Ore—
Austria, 93 t. H. R. Merton & Co.
Portugal, 110 H. Emanuel
E. Indies, 40 Pillow, Jones, & Co.
Turkey, 50 French & Smith

Acetate of Lime—
U. States, £160. Lister & Biggs

Alum—
Holland, 1 pks. Ohlenschlager Bros

Arsenic—
Germany, £100 Williams, Torrey, & Co.

Acetic Acid—
Holland, 5 pks. A. & M. Zimmermann

Bromine—
Germany, £600. ,,

Brimstone—
Italy, 12 t. A. Zumbeck & Co.
,, 5 A. Saker
,, 100 Soundy & Son
,, 167 Johnson & Hooper
,, 10 F. Smith
,, 20 Chippingdale & Thornhill
,, 20 C. Vincent
,, 65 G. Boor & Co.
,, 65 J. Kitchen, Ld.

Bones—
Adelaide, 3 t. Anning & Cobb
U. States, 25 Goad, Rigg, & Co.
Sydney, 20 Hicks, Nash, & Co.

Bone Meal—
E. Indies, 400 t. Gonne, Croft, & Co.

Barytes—
Germany, 72 cks. H. Lambert
,, 93 W. Harrison & Co.
,, 23 O'Hara & Hoar
Belgium, 22 W. Harrison & Co.
Holland, 22 ,,

Borax—
Germany, £22. F. Stahlschmidt & Co.

Barium Chloride—
Germany. £80. Petri Bros.

Cream of Tartar—
France, 5 pks. B. & F. Wf. Cc., Ld.
,, 8 W. C. Bacon & Co.
,, 5 M. Ashby, Ld.
,, 5 B. & F. Wf. Co., Ld.
Spain, 17 ,,

Copperas—
Germany, £25. Burgoyne, Burbidge, & Co.

Copper Regulus—
Adelaide, 20 t. Vivian, Younger, & Co.

Chemicals *(otherwise undescribed)*
Germany, £43. A. & M. Zimmermann
,, 22 F. Stahlschmidt & Co.
,, 400 Phillipps & Graves
,, 25 ,,
,, 111 W. Burton & Sons
,, 368 A. & M. Zimmermann
,, 20 Kaul & Haenlein
,, 45 T. H. Lee
,, 13 Bot. & Nich.'s Wvs. Co.
France, 27 N. Steinberg
Germany, 17 H. Lambert
,, 420 A. & M. Zimmermann
,, 43 Phillipps & Graves

Caustic Potash—
France, 42 pks. F. W. Berk & Co.

Caoutchouc—
Inhambane, 26 c. Lewis & Peat
Natal, 8 J. T. Rennie, Son, & Co.
E. Indies, 187 Ralli Bros.
,, 6 Ide & Christie
Holland, 54 H. Kiver & Co
E. Indies, 51 Ross & Deering

Dyestuffs—
Argols
Italy, 815 pks. B. Jacob & Sons
,, 748 ,,
,, 212 Thames S. Tug Co.
Alizarine
France, 275 pks. L. J. Levinstein & Son
Holland, 52 J. Forsey
Indigo
Germany, 1 chts. F. W. Heilgers
E. Indies, 43 L. & I. D. Jt. Co.
,, 10 J. Owen
,, 12 A. Harvey & Co.
Extracts
France, 42 pks. Prop. Chmblin's. Wf.
U. States, 50 W. Burton & Co.
France, 4 T. H. Lee
Austria, 390 A. J. Humphrey
Gambier
Singapore, 433 pks. L. & I. D. Jt. Co.
,, 425 J. Forsey
,, 7 Elkan & Co.
,, 646 W. H. Cole & Co.
,, 296 Cox, Patterson, & Co.
,, 556 W. H. Cole & Co.
,, 243 L. & I. D. Jt. Co.
Tanners' Bark
Germany, 42 t. E. Davies & Co.
Adelaide, 97 Devitt & Hett
Melbourne, 69 Baxter & Hoare
Sydney, 50 Culverwell, Brooks, & Co.
Natal, 17 Hicks, Nash, & Co.
Adelaide, 31 Baxter & Hoare
,, 32 Devitt & Hett
,, 233 Baxter & Hoare
Belgium, 9 Leach & Co.
Durban, 5 A. & W. Nesbitt
Holland, 11 Sawer, Mead, & Co.
Adelaide, 119 G. & R. Wills & Co
Melbourne, 103 L. & I. D. Jt. Co.
Valonia
Smyrna, 125 t. Hicks, Nash, & Co.
,, 15 A. J. Humphrey
Italy, 100 Hicks, Nash, & Co.
Smyrna, 6 A. & W. Nesbitt
,, 200 F. Huth & Co.
,, 100 Boutcher, Mortimore, & Co.
Orchella
Natal, 26 pks. L. & I. D. Jt. Co.
Turmeric
France, 600 pks. H. A. Litchfield & Co.
Madders
E. Indies, 23 pks. Ide & Christie
Myrabolams
E. Indies, 380 pks. Tod Durant & Co.
Sumac
Italy, 500 pks. Brown & Elmslie

Gutta Percha—
France, 106 c. Flageollet & Co.
Singapore, 550 Kleinwort, Sons & Co.
,, 1 L. & I. D. Jt. Co.

Glucose—
Germany, 30 pks. 270 cwts. J. Knill & Co.
France, 100 100 J. Barber & Co.
,, 300 300 Trier, Meyer & Co.
U. S. 221 1,105 T. M. Duche & Sons
Germany, 33 264 L. Sutro & Co.
France, 100 100 Seaward Bros.
Germany, 80 600 J. Knill & Co.
U. S., 200 1,140 C. Czarnikow
Germany, 25 220 Horne & Co.
U. S., 96 260 Pillow, Jones & Co.
Germany, 200 200 J. Barber & Co.
,, 25 220 L. & I. D. Jt. Co.
,, 100 100 J. F. Ohlmann
,, 87 690 L. Sutro & Co.

Glycerine—
Germany, £70 Beresford & Co.
Holland, 440 Spies Bros & Co.
France, 322 Ross & Deering

Isinglass—
E. Indies, 6 pks. L. & I. D. Jt. Co.
Penang, 5 ,,
E. Indies, 9 ,,
,, 11 Hale & Son
,, 4 Brookes & Green
Singapore, 4 L. & I. D. Jt. Co.
Penang, 13 ,,
E. Indies, 20 Forbes, Forbes & Co.
,, 4 Clarke & Smith
Singapore, 8 L. & I. D. Jt. Co.
,, 4 Cox, Patterson & Co.
E. Indies, 4 L. & I. D. Jt. Co.

Manure—
Germany, 6 t. N. S. S. Co.
St. Valery, 264 Lawes Manure Co., Ltd.
Germany, 10 Anderson, Weber & Smith
Montreal, 60 Cornwell, Son & Co.
Spain, 39 G. Bennett & Sons
France, 130 F. Farmer & Co.
Phosphate Rock
Germany, 150 t. Anglo-Contl G. Wks.
Montreal, 300 A. Hunter & Co.
Aruba, 430 G. M. Bauer

Nitre—
Pisagua, 5,985 bgs. W. Montgomery & Co.

Naphtha—
Holland, 20 drs Burt, Boulton & Co.
,, 40 ,,

Plumbago—
Germany, 37 cks. Beresford & Co.
,, 20 Brown & Elmslie
E. Indies, 378 brls. J. Forsey
Germany, 42 cks. Le Sucur & Co.
,, 17 brls. Beresford & Co.

Pearl Ashes—
France, 98 c. Petri Bros.
Montreal, 120 Charles & Fox

Pyrites—
La Laja, 200 t. Forbes, Abbott & Co.
Spain, 50 ,,

Paraffin Wax—
U. S, 121 brls. G. H. Frank
,, 100 H. Hill & Sons
,, 100 E. & H. Houldsworth

Potassium Carbonate—
Germany, 21 pks. Middleton & Co.

Permanganate—
Holland, £25 H. Boyce
Montreal, 240 J. Barber & Co.

Saltpetre—
Belgium, 500 bgs. Anglo-Contl. G. Wks.
Germany, 72 cks. J. Hall & Son
Holland, 65 C. Wimble & Co.
Germany, 40 brls. P. Becker & Co.
E. Indies, 250 bgs. C. Wimble & Co.

Sodium Acetate—
France, £38 Prop. Hay's Wf.

Stearine—
France, 120 bgs. H. Hill & Sons
,, 60 ,,
Belgium, 122 ,,
,, 125 ,,
,, 62 W. Balchin

Tartars—
Italy, £550 Seager, White & Co.
,, 1,000 Howard & Son
,, 1,960 B. Jacob & Sons
,, 550 Seager, White & Co.

Tartaric Acid—
Holland, 30 pks. B. & F. Wf. Co. Ld.
,, 4 Hapsburg, Hoff & Co.
,, 4 Augspurg, Hopf & Co.
,, 12 B. & F. Wf. Co.

Ultramarine—
Holland, 23 pks. Haeffner, Hilpert & Co.
,, 4 Ohlenschlager Bros.
,, 12 Phillipps & Graves
Germany, 20 H. Lambert
,, 12 cs. G. Steinhoff

Verdigris—
France, £53 Skilbeck Bros.

Zinc Oxide—
Holland, 100 brls. M. Ashby, Ltd.

LIVERPOOL.

Week ending June 24th.

Acetate of Lime—
St. Nazaire, 84 sks.

Albumen—
Marseilles, 10 cs.

Bones—
New York, 200 sks.
Smyrna, 220 bgs.
Cocanada, 758
Vizagapatam, 1,538
Boston, 177 sks. J. Gordon & Co.

Bone Meal—
Bombay, 600 bgs.
,, 50 brls.

Caoutchouc—
Constantinople, 39 brls.
Old Calabar, 3 cks. African Association
,, 1 brl. Daumas & Co.
,, 3 ,,
Addah, 3 pks. Pickering & Berthoud
Accra, 2 J. H. Rayner & Co.
,, 11 J. P. Werner
,, 2 brls. ,,
Salt Pond, 2 Pickering & Berthoud
,, 2 1 ck. Edwards Bro.
,, 13 W. B. McIver & Co.
,, 2 cks. A. Millerson & Co.
,, 2 Davis, Robbins & Co.
,, 1 F. & A. Swanzy
,, 39 cks. Miller, Bros. & Co.
,, 1 Mordaunt Bros.
,, 1 bx. 3 brls.
Cape Coast, 4 Radcliffe & Durant
,, 4 cs. 3 Edwards Bros.
,, 2 L. Hart & Co.
,, 6 Millerson & Co.
,, 2 10 Fletcher & Fraser
,, 18 2 Grimwade, Ridley & Co.
,, 1 A. Reis
,, 5 Ellis & Co.
,, 5 Mordaunt Bros.
,, 1 W. Duff & Co.
,, 2 Kronig & Siegler
,, 1 J. Smith
,, 6 cs W. B. McIver & Co.
,, 3 H. B. W. Russell
,, 22 ,,
Axim, 4 bgs. Radcliffe & Durant
,, 7 Pickering & Berthoud
,, 4 Edwards Bros.
,, 3 Millerson & Co.
,, 5 E. Grand
,, 3 pks. Millward Bradbury & Co.
Attaobor, 9 bgs. Edwards Bros.
,, 9 Pickering & Berthoud
,, 1 Millerson & Co.
,, 12 Radcliffe & Durant.
Grand Bassa, 1 brl. Brierley & Co
Sierra Leone, 68 pks. Cie Francaise
,, 14 brls Waterhouse & Sons
,, 9 Pickering & Berthoud
,, 7 Palma Trading Co.
Salt Pond, 4 Radcliffe & Durant
,, 6 F. & A. Swanzy
,, 3 D. Jones & Co.
,, 1 W. B. McIver & Co.
,, 2 Havard & Co.
,, 1 ,,
,, 9 Pickering & Berthoud
C. C. Castle, 3 Davies, Robbins & Co.
,, 5 3 cs. Fletcher & Fraser
,, 1 C. L. Clare & Co.
,, 2 Challenor & Co.
,, 12 ,,
Sierra Leone, 19 brls. 1 pn. 4 pks. Paterson, Zochonis & Co.
,, 4 brls. Cie Francaise
,, 8 Palma Trading Co.

Caoutchouc—*continued.*
New York, 4 cs. C. Macintosh & Co.
Manaos, 367
Para, 80
Philadelphia, 6 hds.
Cream of Tartar—
Bordeaux, 1 ck.
Chemicals *(otherwise undescribed)*
Rotterdam, 5 cks.
Havre, 7 cs. Cunard S. S. Co Ltd.
Dyestuffs—
Argols
Bordeaux, 63 cks.
Oporto, 23 cks. German Bank, London
Divi Divi
New York, 229 bgs. B. Hall & Co.
Cochineal
Las Palmas, 23 bgs. Kolp & Co.
,, 10 Widow Duranty & Son
,, 13 Swanston & Co.
Gr. Canary, 10
Valonia
Syra, 327 bgs. Androules Bros
Smyrna, 505 t. Barry Bros.
,, 405 bgs. 160 t.
Constantinople, 3 bls.
Myrabolams
Bombay, 879 bgs.
Extracts
Philadelphia, 150 bxs.
New York, 11 brls.
Madders
Marseilles, 1 ck.
Syra, 6 bls.
Sumac
Bordeaux, 50 bls.
Dyestuffs *(otherwise undescribed)*
Marseilles, 20 bls.
Dried Blood—
Monte Video, 541 bgs. J. Purdon
Glycerine—
Marseilles, 1 brl. J. Brooks
Glucose—
New York, 50 brls.
Stettin, 200 bgs.
Philadelphia, 230 brls.
Horn Piths—
Monte Video, 45 t. B. Watson & Co.
Iodine—
Valparaiso, 251 brls. A. Gibbs & Sons
Manganese Ore—
Gothenburg, 210 t. Macqueen Bros.
Manganese—
Coquimbo, 985 t.
Manure—
Phosphate Rock
Beaufort, 2,000 t.
Naphtha—
New York, 3,000 brls.
Oxalic Acid—
New Fairwater, 2 cks.
Phosphate—
Ghent, 250 t. Phospho Guano Co.
Montreal, 700 t.
Phosphates—
Ghent, 2,039 bgs.

Potash—
Montreal, 15 brls. Stolterfoht Sons & Co.
Pyrites—
Huelva, 1,245 t. Tennants & Co.
,, 2,066 Matheson & Co.
Pitch—
Amsterdam, 15 cks.
Hamburg, 1 cs.
Soda—
New York, 4 brls.
Sodium Nitrate—
Iquique, 7,727 bgs. W. & J. Lockett
,, 7,512 Duncan, Fox & Co.
Stearine—
New York, 20 hds.
Tartaric Acid—
Marseilles, 20 brls.
,, 9
Rotterdam, 20 kgs.
Turpentine—
Wilmington, 250 brls.
Ultramarine—
Hamburg, 1 ck.

GRIMSBY.

Week ending June 21st.

Albumen—
Hamburg, 7 cks.
Chemicals *(otherwise undescribed)*
Hamburg, 6 pks.
Dyestuffs—
Extracts
Dieppe, 37 cks.
Dyestuffs *(otherwise undescribed)*
Antwerp, 10 pks.
Glucose—
Hamburg, 15 cks.
Pitch—
Dieppe, 6 pks.

GOOLE.

Week ending June 18th.

Alum—
Rotterdam, 27 cks.
Antimony Ore—
Boulogne, 2 cks.
Caustic Potash—
Calais, 19 brls.
Caoutchouc—
Boulogne, 1 cks. 1 ck. 3 cs.
Dyestuffs—
Alizarine
Rotterdam, 22 cks.
Extracts
Hamburg, 20 cks.
Rouen, 1
Logwood
Monte Christi, 250 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 128 cks. 2 cs. 5 jrs. 1 crby.
Glucose—
Hamburg, 60 bgs. 36 cks.
Manure—
Phosphate Rock
Ghent, 1,517 bgs.

Potash—
Dunkirk, 30 drums 4 cks.
Saltpetre—
Rotterdam, 200 bgs.
Waste Salt—
Hamburg, 280 t. 1,334 cks. 511 bgs.

HULL.

Week ending June 26th.

Arsenic—
Hamburg, 3 cks. Wilson Sons & Co.
Barytes—
Antwerp, 42 cks. Bailey & Leetham
,, 63 H. F. Pudsey
Bremen, 13
Chemicals *(otherwise undescribed)*
Dunkirk, 220 pks. Wilson Sons & Co.
Antwerp, 34 ,, ,,
Rotterdam, 1 ck. Hutchinson & Son
Hamburg, 15 pks. Wilson Sons & Co.
Antwerp, 37 ,, ,,
Stettin, 59 ,, ,,
Carbolic Acid—
Hamburg, 1 bottle Wilson Sons & Co.
Dyestuffs—
Madders
Rotterdam, 3 cks.
Alizarine
Rotterdam, 25 cks. W. & C. L. Ringrose
,, 28 pks. Hutchinson & Son
,, 20 cks. ,, ,,
Rennet
Copenhagen, 3 pks. C. M. Lofthouse & Co.
Myrabolams
Bombay, 5,057 bgs.
Glucose—
Hamburg, 10 cks.
Stettin, 80 bgs. Wilson Sons & Co.
,, 1,200 C. M. Lofthouse & Co.
Hamburg, 12 cs.
Napthol—
Rotterdam, 1 cs.
Pitch—
Antwerp, 12 cks. H. F. Pudsey
Rotterdam, 44 brls. G. Lawson & Sons
Phosphorus—
Rouen, 23 cs. Rawson & Robinson
,, 100 cs.
Phosphate—
Ghent, 160 t. Wilson Sons & Co.
Plumbago—
Hamburg, 170 cks.
Sodium Silicate—
Rotterdam, 1 ck. G. Lawson & Sons
Sulphur Chloride—
Rotterdam, 4 cs. G. Lawson & Sons
Soda—
Rotterdam, 8 cks. G. Lawson & Sons
Tartar—
Bordeaux, 1 ck. Rawson & Robinson
Tartaric Acid—
Rotterdam, 2 cks. G. Lawson & Son
Turpentine—
Libau, 109 cks.

TYNE.

Week ending June 24th.

Arsenic—
Hamburg, 1 ck. Tyne S. S. Co.
Copper Precipitate—
Huelva, 294 t. Scott Bros.
Pomaron, 3 442 bgs. Mason & Barry
Copper Ore—
Arendal, 2 bxs.
Glucose—
Hamburg, 10 cks. Tyne S. S. Co.
Rotterdam, 50 bls. ,, ,, ,,
Pyrites—
Huelva, 1,111 t. Scott Bros.
Phosphate—
Charleston, 2,200 t. Langdale's Chemical Co.
Sulphur Ore—
Pomaron, 1,050 t. Mason & Barry
Tartaric Acid—
Rotterdam, 4 cks. Tyne Steam Shipping Co.
Zinc Oxide—
Antwerp, 55 brls. Tyne S.S. Co.

GLASGOW.

Week ending June 26th.

Bones—
Catania, 225 t. T. Laurie
Brimstone—
Catania, 850 t. T. Laurie
Chemicals *(otherwise undescribed)*
Hamburg, 2 cs.
,, 1
Dyestuffs—
Extracts
Antwerp, 5 cks.
Alizarine
Rotterdam, 108 cks.
Glucose—
New York, 25 brls.
Hamburg, 8 cks.
Gutta Percha—
Amsterdam, 6 bgs.
Glycerine—
Rotterdam, 17 cks. J. Rankine & Son
Potassium Muriate—
Harburg, 210 t. Eglinton Chemical Co. Ltd.
Sodium Acetate—
Antwerp, 9 cks.
Sodium Nitrate—
Iquique, 7,924 bgs.
Turpentine—
Wilmington, 500 brls.
Brunswick, 1,000
Ultramarine—
Rotterdam, 1 ck. 5 cs. J Rankine & Son
Zinc Oxide—
Antwerp, 50 brls.
Rotterdam, 100cks.
New York, 150 brls.

EXPORTS OF CHEMICAL PRODUCTS

OF

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending June 18th.

Alkali—
Melbourne, 528 c. £163
Alum—
Batoum, 30 t. £178
Acids *(otherwise undescribed)*
Melbourne, 2 cs. £18
Ammonium Muriate—
Libau, 2 cks. £20
Ammonia—
Adelaide, 1 t. 2 c. £29
Ammonium Carbonate—
New York, 75 pks. £470
B. Ayres, 10 c. 20
St. Petersburg, 96 323
Adelaide, 5 12

Ammonium Sulphate—
Hamburg, 10 t. 6 c. £115
,, 40 10 444
Barbadoes, 50 595
Trinidad, 215 1 307
Acetic Acid—
Lyttleton, 2 cks. £16
Alum Cake—
Calcutta, 240 cks. £166
Arsenic—
Calcutta, 2 t. 10 c. £54
San Francisco, 1 10 25
Wellington, 2 10 33
Amsterdam, 6 cks. 18
Benzoic Acid—
Hamburg, 1 cs. £15
Borax—
Batoum, 3 t. 4 c. £92
Constantinople, 1 10 42
Hamburg, 19 56
,, 7 19

Bisulphate of Lime—
Sydney, 4 t. 14 c. £31
Carbolic Solid—
New York, 85 pks. £370
Coal Products—
Pitch
Calcutta, 100 rlts. £47
Braila, 50 cks. 14
Rouen, 24 90
Calcutta, 50 rlts. 24
Antwerp, 175 t. 280
Anvers, 129 193
Tar
Calcutta, 500 rlts. £278
Sydney, 40 brls. 34
Norrkoping, 500 290
Gothenburg, 205 rlts. 145
Calcutta, 229 126
Auckland, 10½ cks. 30 dms. 12

Benzole
Rotterdam, 20 cks. £336
Calais, 20 462
Hamburg, 20 drs. 278
Rotterdam, 40 cks. 692
Anthracene
Rotterdam, 67 cks. £540
Naphthaline
New York, 54 cks. £45
Rotterdam, 666 bgs. 106
Hamburg, 43 cks. 8 bgs. 179
New York, 154 131
Citric Acid—
Hamburg, 5 c £25
Constantinople, 1 ck. 7
B. Ayres, 1 8
Terneuzen, 11 68
Melbourne, 3 24
Genoa, 2 t. 290
St. Petersburg, 3 kgs. 21

Carbon Bisulphide—
Cape Town, 37 t. 4 c. £508
New Orleans, 20 drs. 21
Caustic Soda—
Brisbane, 1,388 lbs. £42
N. Orleans, 94 t. 10 c. 1,000
Madagascar, 1 3 12
Copper Sulphate—
Algoa Bay, 9 c. £11
Salonica, 1 t. 105
Treport, 10 214
Wellington, 1 25
Bordeaux, 8 192
,, 30 720
,, 25 600
Leghorn, 10 240
Naples, 5 120
Varna, 1 5 c. 30
Leghorn, 10 12
Genoa, 20 2 502
Bordeaux, 14 19 345
Cream of Tartar—
Lyttleton, 1 t. £113
Auckland, 1 110
Melbourne, 1 105
Sydney, 1 101
Timœru, 2 c. 11
Otago, 11 58
Melbourne, 10 52
Chemicals *(otherwise undescribed)*
New York, 20 cs. £226
Flushing, 1 26
Toronto, 10 35
Hamilton, 10 pks. 35
Hamburg, 2 10
Port Natal, 12 drs. 15
Natal, 23 c. 21
B. Ayres, 3 cks. 12
Brisbane, 4 pks. 13
,, 2 cs. 22
B. Ayres, 10 kgs. 27
,, 52 pks. 147
Rosario, 48 78
M. Video, 10 kgs. 8
Brisbane, 2 cs. 26
Disinfectants—
Sydney, 4 cs. £11
Brisbane, 4 17
Canterbury, 1 21
Brisbane, 5 44
San Francisco, 101 pks. 65
Ehrmanite—
Mauritius. 5 t. £150
Glycerine—
Cologne, 215 c. £340
Iron Oxide—
Cape Town, 5 t. 10 c. £16
Manure—
Valencia, 332 t. £3,320
Wellington, 10 55
Barbadoes, 100 1,250
Amsterdam, 60 750
Riga, 227 1 c. 691
Hobart, 6 31
Rouen, 10 35
Malaga, 55 11 476
Barbadoes, 50 625
Lyttleton, 160 2,160
Hamburg, 290 3,625
Naphthaline—
Hamburg, 33 cks. £57
Potassium Chlorate—
Gothenburg, 8 c. £17
Alexandria, 1 t, 45
Potash—
Calcutta, 11 c. £60
Potassium Sulphate—
Barbadoes, 29 t. 15 c. £317
Berbice, 5 60
Potassium Cyanide—
Shanghai, 3 c. £18
Phosphorus—
San Francisco, 3 c. £26
Demerara, 1 8
Potash Crystals—
Brussels, 2 cs. £50
Salammoniac—
Canterbury, 23 c. £29
Batoum, 3 t. 102
Toronto, 6 13
Spent Oxide—
Baltimore, 100 t. £226
Sugar of Lead—
B. Ayres, 11 c. £15
Soda Powder—
Sydney, 22 cks. £60
Saltpetre—
Oporto, 3 t. 14 c. £77
Santos, 20 brls. 19
Oporto, 3 t. 15 c. 79
Saltpetre—*continued.*
Rio Janeiro, 1 t. 9 c. £33
Santos, 2 9 55
P. Alegre, 1 4 28
Soda Crystals—
Townsville, 5 t. 7 c. £17
Sulphur—
Sydney, 5 t. £33
Demerara, 2 5 c. 14
Sulphuric Acid
E. London, 2 t. £21
Sheep Dip—
Algoa Bay, 25 cs. 1,500 gls. £245
,, 165 pks. 83
Canary, 1 cs. 5
Dunmore, 5 cks. 20
Natal, 475 drs. 13 cs. 165
Algoa Bay, 11 t. 5 c. 450
Wellington, 13 19 690
Melbourne, 16 5 825
Wellington, 1 14 30
Sodium Nitrate—
Huelva, 10 t. 1 c. £86
Tartar Salts—
Sydney, 7 drs. £21
Tartaric Acid—
Lyttleton, 3 c. £21
,, 2 14

LIVERPOOL.

Week ending June 21st.

Acetic Acid—
Lisbon, 5 t. 13 c. 3 q. £63
Alum Cake—
Gothenburg, 29 t. 12 c. £91
Ammonium Sulphate—
Barcelona, 10 t. 10 c. £115
Valencia, 10 3 1 q. 115
Demerara, 20 240
Hamburg, 49 14 1 600
Valencia, 16 10 198
Bombay, 9 16 3 120
Alum—
Oporto, 5 t. 3 c. £26
Madras, 7 5 35
Bombay, 7 10 40
Montreal, 3 7 17
Beyrout, 1 12 1 q. 8
Calcutta. 24 6 123
Constantinople, 6 32
Galatz, 6 2 31
Madras, 2 19 1 15
Ammonium Carbonate—
Leghorn, 10 c. 1 q. £117
Seville, 6 9
Antimony Regulus—
Gijon, 4 c. 1 q, £18
,, 4 1 18
Ammonium Muriate—
B. Ayres, 5 t. 2 c. 1 q. £120
New York, 8 7 192
Philadelphia, 6 4 142
Montreal, 1 1 2 15
Bleaching Powder—
Batoum, 33 cks.
Boston, 405 145 tcs.
Bremerhaven, 8
Genoa, 248
Ghent, 189
Hamburg, 91
Hong Kong, 30 cs.
New York, 264 76
Oporto, 12
Rotterdam, 39
Trieste, 28
Vera Cruz, 20 brls.
Antwerp, 34
Baltimore, 51
Boston, 66
Havre, 25
Nantes, 14
Odessa, 15
Rouen, 17
Hamburg, 32
Montreal, 25
Bichromate—
Alexandria, 18 c. £32
Borate of Lime—
Rotterdam, 10 t. 3 c. 1 q. £120
Brimstone—
Calcutta, 22 t. 10 c. £95
Boston, 25 107
Borax—
Rosario, 2 t. 9 c. 1 q. £69
Amsterdam, 8 3 15
Rotterdam, 2 2 57
Monte Video, 1 14 49
New York, 1 12 46
Carril, 5 8
Caustic Potash—
Montreal, 3 t. 15 c. £85
New York, 2 3 43
Caustic Soda—
Adelaide, 18 drms.
Algiers, 5
Alicante, 40 cks.
Antwerp, 28
Barcelona, 150 100 70 brls.
Boston, 700
Callao, 20
Cienfuegos, 12
Genoa, 78
Gothenburg, 71
Hamburg, 36
Iquique, 400
Leghorn, 6
Lisbon, 7
Madrid, 200
Malta, 5
Manilla, 100
Melbourne, 30
Messina, 120
Montreal, 82
Nantes, 69
N. Orleans, 86
New York, 534
Odessa, 75
Palermo, 82
Pasages, 65
Pernambuco, 30
Rotterdam, 48
San Francisco, 250
San Sebastian, 45
Seville, 50 65 cks.
Shanghai, 78
Stockholm, 6
Valencia, 60
Valparaiso, 110
Venice, 10
Alicante, 3
Amsterdam, 183
Ancona, 84
Barcelona, 107
Bari, 26
Batoum, 100
Bilbao, 61
Bombay, 8
Boston, 100
Carthagena, S., 15
,, U.S.C., 4
Catania, 10
Ceara, 10
Chicago, 50
Galatz, 30
Genoa, 146
,, 39
Ghent, 9
Hamburg, 10
Havana, 30
Hiogo, 200
Iquique, 15 cs.
Leghorn, 50
Lisbon, 60
Malaga, 15
Malmo, 5
Manila, 100
Melbourne, 18
Nantes, 89
Naples, 83
New York, 120
,, 250
Odessa, 25
Philadelphia, 50 165 brls.
Rouen, 110
San Francisco, 20
Santander, 27 24 cks.
Santos, 20
Seville, 252
Singapore, 30
Tarragona, 8
Vigo, 15
Yokohama, 500
Cadiz. 30
Charcoal—
Rotterdam, 19 t. 15 c. £97
Calcium Chloride—
Bordeaux, 5 t. 8 c. £9
Carbolic Acid—
Havana, 8 c. £30
Rotterdam, 12 72
Havre, 19 t 241
Hong Kong, 1 1 3 q. 14
New York, 1 18 1 26
Shanghai, 11 3 8
Copper Sulphate—
Rouen, 48 t. 8 c. £1,210
Bordeaux, 250 15 3 q. 6,362
Constantinople, 10 8
Genoa, 10 6 2 195
,, 5 2 2 125
,, 3 8 3 95
Tarragona, 10 246
Venice, 6 4 2 120
Copper Sulphate—*continued.*
Marseilles, 41 t. 2 c. 3 q. £1,027
Monte Video, 19 2 16
Odessa, 17 2 16
Barcelona, 16 79
Valparaiso, 2 8 60
Adelaide, 10 225
Bordeaux, 82 13 1,782
Havre, 29 19 1 598
Vigo, 8 3 9
Odessa, 2 2 2 45
Bordeaux, 46 10 3 951
Callao, 17 3 19
Marseilles, 228 7 5,650
Genoa, 32 9 675
,, 78 3 1,582
,, 29 16 3 628
Marseilles, 20 500
Bordeaux, 10 3 250
Nantes, 77 2 1,925
Pasages, 10 3 1 250
Leghorn, 9 18 212
Bilbao, 7 19 3 199
Bordeaux, 804 14 7,175
Copperas—
Volo, 4 t. 3 c. £9
Smyrna, 3 6
Syra, 4 3 q. 10
Volo, 3 8 3 8
Kurrachee, 23 10 55
Calcutta, 27 10 53
Citric Acid—
Valparaiso, 13 1 94
Carril, 3 21
Chemicals *(otherwise undescribed)*
Ambriz, 11 c. 1 q. £7
Vera Cruz, 18 2 22
Bombay, 8 t. 65
Disinfectants—
New York, 5 cks. £45
Epsom Salts—
Bombay, 200 kgs.
Montreal, 25 brls.
Gypsum—
New York, 10 t. 2 c. £30
Horn Waste—
Genoa, 10 t. 7 c. £80
Hypophosphate of Lime—
Philadelphia, 10 c. £140
Iodine—
Hamburg, 7 t. £4,200
Iron Oxide—
New York, 15 t. £64
Leather Waste—
Havre, 1 t. 10 c. £15
Magnesium Calcide—
Constantinople, 21 lbs. £50
Muriatic Acid—
Antofagasta, 1 c. 2 q. £5
Oxalic Acid—
New York, 3 t. 3 q. £99
Potassium Carbonate—
Montreal, 5 c. £6
Potassium Bichromate—
Rouen, 5 t. 7 c. £175
Aleppo, 3 6
Barcelona, 12 16 2 q. 485
Salonica, 9 2 15
Bari, 1 2 2 39
Rouen, 5 7 1 175
Pitch—
Callao, 5 brls.
Carril, 60
Cette, 580 t.
Constantinople, 15
Marseilles, 1,650
Potassium Chlorate—
St. Petersburg, 16 t. £640
Hamburg, 2 t. 79
Oporto, 10 c. 26
Lisbon, 19 39
Boston, 5 233
Barcelona, 1 42
Vera Cruz, 2 5
Genoa, 1 44
Shanghai, 1 8 78
Naples, 4 10
Stockholm, 5 200
Potassium Bicarbonate—
Leghorn, 1 t. £28
Potassium Chromate—
Havre, 1 t. 7 c. £40
Phosphorus—
Shanghai, 14 c. £70
,, 12 70
Sodium Biborate—
New York, 10 c. £15
Rotterdam, 3 t. 6 2 q. 100

Salammoniac—
Amsterdam, 6 c. £10
Kurrachee, 1 t. 7 47
Malta, 5 9
Salonica, 1 1 37
Bombay, 5 11 1 q. 195
Naples, 1 8 52
New York, 13 1 24
Ibrail, 10 18
Seville, 10 2 18

Sodium Bicarbonate—
Antwerp, 46 kgs. 1 ck.
Batoum, 50
Bremerhavn, 15 3
Calcutta, 400
Genoa, 80
Hamburg, 20
Madras, 150
Malaga, 125
Naples, 25
New York, 10 brls.
Rotterdam, 4
San Juan, 20
Santander, 40
Seville, 30 4
Trieste, 160 20
Valencia, 154
Hiogo, 200
Melbourne, 80
Yokohama, 100

Soda Ash—
Baltimore, 131 tcs. 144 cks.
Bombay, 2
Ghent, 57
Hong Kong, 6 brls.
Maceio, 15
New York, 1,296 tcs. 127
Philadelphia, 141 128
Rio Janeiro, 110
Baltimore, 189
Barcelona, 235 brls.
Boston, 948 bgs. 169 cks. 260 tcs.
Havana, 1
Kobe, 133 brls.
Monte Video, 50
New York, 1,070 tcs. 238
Oporto, 25 pps. 15 tcs. 10 cks.
Philadelphia, 194
Rio Janeiro, 50 brls. 2
Rouen, 9
San Francisco, 195
Santos, 10
Smyrna, 100
Melbourne, 25

Salt—
Accra, 5 t.
Adelaide, 100
Benin, 50
Buguma, 70
Chicago, 200
Ghent, 225
Halifax, 500
Montreal, 390
New Orleans, 120
New York, 760
North Sydney, 300
Para, 71 8 c.
Rio Janeiro, 100 cs.
Rotterdam, 410
St. John, N.B., 1,007
Sydney, 50
Victoria, B.C., 50
San Francisco, 110
Abonnema, 6
B. Ayres, 18
Calcutta, 1,372
,, 1,850
Chicago, 191
Ghent, 195
Hamburg, 289
Iceland, 408
Kingston, 10
Landana, 15
Monte Video, 8
Montreal, 300
New York, 250
Old Calabar, 170 13 c.
Para, 35 14
Rio Janeiro, 1
Shediac, 300
Valparaiso, 108 14

Soda Crystals—
Calcutta, 30 cks. 65 brls.
Malta, 100
Philadelphia, 335
New York, 333
Amsterdam, 22
Constantinople, 50 brls.
Kustendjie, 20
Monte Video, 15
Phiadelphia, 748 cks.
Wellington, 50
Demerara, 15

Sodium Silicate—
Alicante, 16 cks.
Bilbao, 32
Callao, 10 brls.
Lisbon, 7

Sodium Silicate—*continued.*
Malta, 20
Melbourne, 41
Montreal, 62
Naples, 6
Oporto, 12
San Sebastian, 16
Syra, 5
Smyrna, 20
Sydney, 46

Sugar of Lead—
Ibrail, 19 c. £26

Saltcake—
Baltimore, 51 t. 9 c. £118
Ghent, 50 69

Sodium Chlorate—
Genoa, 9 c. £26
New York, 5 t. 263

Sulphuric Acid—
Callao, 84 gls. £8

Sulphur—
Rouen, 16 t. £75
Demerara, 21 18 c. 3 q. 131
Montreal, 17 19 3 85
St. John, N.B., 3 7 2 25
Colombo, 7 10 46
Lisbon, 29 9 1 237
Boston, 50 2 215

Saltpetre—
Maranham, 10 c. 1 q. £13
Para, 10 11
Maranham, 10 12
Syra, 2 t. 1 43
Valencia, 1 1 23
Piræus, 7 10 162
Maceio, 9 10
Ceara, 9 3 11

Sodium Nitrate—
Almeria, 3 t. 2 q. £25
,, 3 16 c. 3 30
Valencia, 6 3 3 51
Demerara, 30 5 3 265
Santander, 1 1 3 9
Almeria, 5 3 42
Trieste, 13 1 108

Tar—
Halifax, 17 t.
Rosario, 150 dms.

GLASGOW.

Week ending June 26th.

Bleaching Powder—
Melbourne, 10 t. 5¾ c. £60

Benzole—
Rotterdam, 19 drms. £171

Borax—
Stockholm, 17 cks. £188

Dyestuffs—
Logwood
Rotterdam, 11 t. 16¾ c. £82. 17s.
Extracts
Montreal, £71

Epsom Salts—
Lisbon, 6 t. 2 c. £24
Calcutta, 22 103
Quebec, 238¼ 48

Glycerine—
Rouen, 19 t. ½ c. £386

Naphtha—
Rouen, £405

Oxalic Acid—
Quebec, 21 c. £35

Potassium Bichromate—
Venice, 1 t. 18 c. £70
Lisbon, 121 237
Stettin, 5 174
Bergen, 3 cks. 38
New York, 496 927
Stockholm, 2 25
Rouen, 5 t. 7 169
Rotterdam, 57 cks. 440
,, 1 8

Paraffin Wax—
Malta, 3 t. 3¼ c. £98
Shanghai, 5 17 150
,, 1 1 25
Antwerp, 2 5 65
Rouen, 3 11½ 84

Pitch—
Halifax, 41 t. 17½ c. £78

Soda Salts—
Christiania, 1 ck. £9

Sodium Bichromate—
New York, 498 c. £697

Sodium Nitrate—
New York, 5 t. 4 c. £45

Tar—
Stockholm, 20 brls. £12
Calcutta, 4 t. 40

HULL.

Week ending June 24th.

Alkali—
Constantinople, 50 cks.
Catania, 3
Riga, 30
Trieste, 20

Bone Size—
Harlingen, 10 cks.

Bleaching Powder—
Bremen, 7 cks.
Odessa, 40
Venice, 10

Caustic Soda—
Antwerp, 24 drms.
Bari, 10
Fuime, 35
Libau, 30
Marseille2, 375
Riga, 40
Revel, 35 10 cks.
S. Petersburg, 650
Trieste, 17
Venice, 50
Wasa, 50
Odessa, 135

Chemicals *(otherwise undescribed)*
Antwerp, 37 cs. 1 ck.
Amsterdam, 185 pks. 5
Bari, 11
Copenhagen, 2
Christiania, 42 19 10 cs.
Constantinople, 25
Dronthiem, 1
Danzig, 3 45 164 slbs.
Gothenburg, 16 2 12 cs.
Genoa, 6 81
Hamburg, 40 165 72
Konigsberg, 17
Libau, 20
Leghorn, 10
Marseilles, 5 20 75
New York, 70 drms. 2
Naples, 10
Odessa, 5 pks. 203
Riga, 162
Rotterdam, 41 cs. 41 2 pks.
Stettin, 57 18
St. Petersburg, 200
Stockholm, 2
Trieste, 23

Dyestuffs *(otherwise undescribed)*
Antwerp, 1 ck.
Hamburg, 13 6 cs.
Stettin, 80 bgs.
Rotterdam, 3 kgs. 3 11 cks.

Manure—
Genoa, 95 bgs.
Hamburg, 842
Stettin, 51 t.

Pitch—
Antwerp, 284 t.

Tar—
Christiania, 5 cks.
Genoa, 50
Hamburg, 6

GRIMSBY.

Week ending June 21st.

Coal Products—
Dieppe, 30 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 7 pks.
Dieppe, 77

GOOLE.

Week ending June 18th.

Bleaching Powder—
Antwerp, 35 cks.
Ghent, 28

Benzole—
Rotterdam, 197 cks. 17 drms.

Coal Products—
Ghent, 20 drms.
Rotterdam, 46 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 18 drms.
Dunkirk, 20 cks.
Ghent, 3 1 cs.
Hamburg, 57

Dyestuffs *(otherwise undescribed)*
Antwerp, 15 bgs.
Boulogne, 1 ck. 1 cs.
Hamburg, 106
,, 200 bgs.
Ghent, 120

Manure—
Rotterdam, 303 bgs.

Pitch—
Antwerp, 211 t.

Zinc—
Antwerp, 7 bgs.

TYNE.

Week ending June 24th.

Antimony—
St. Petersburg, 6 t.

Alum Cake—
Odessa, 10 t. 6 c.

Alumina Sulphate—
Montreal, 25 t. 13 c.

Alkali—
Amsterdam, 28 t. 2 c.
Copenhagen, 2 14
,, 10 13
Bergen, 2 17
Hamburg, 5 2
Gothenburg, 3 12

Ammonium Carbonate—
Odense, 1 1 c.

Bleaching Powder—
St. Petersburg, 91 t. 18 c.
Rotterdam, 6 7
Hamburg, 29 7
,, 20 5
Antwerp, 32 10
Christiania, 12
,, 20 1
Amsterdam, 32 13
,, 31 5
Odessa, 8
Newfairwater, 48 7
Drontheim, 2 8
St. Petersburg, 31 14
Gothenburg, 5 3

Barytes Carbonate—
Antwerp, 2 t.
Hamburg, 10

Barium Chloride—
Montreal, 11 t. 19 c.

Copperas—
Aarhuus, 2 t. 10 c.
Drontheim 5 5

Caustic Soda—
Odessa, 24 t. 13 c.
Montreal, 7 5
Gothenburg, 6 18
Hamburg, 9 11

Epsom Salts—
Antwerp, 4 t. 18 c.

Litharge—
Copenhagen, 9 c.
Montreal, 10 t. 1 c.
Hamburg, 5

Magnesia—
Antwerp, 2 c.

Pitch—
Rendsburg, 200 brls
,, 5 t.

Potassium Chlorate—
Hamburg, 11 c.
Antwerp, 1 t. 2

Sodium Sulphate—
Libau, 9 t. 11 c.
,, 10 5
Gothenburg, 7 9

Superphosphate—
Pernau, 250 t.
Helsingfors, 650 3 c.

Soda Ash—
Newfairwater, 10 t. 4 c.
Hamburg, 10 15
Gothenburg, 25 8
Venice, 10 7

Soda—
Odense, 16 t. 15 c.
Constantinople, 8 3
Copenhagen, 82 10
,, 8 1
Montreal, 48 14
,, 18 2
Gothenburg, 6 18
Drammen, 20 2
Fredericia, 10 18
Aarhuus, 6 19
Nakskov, 6 14
Esbjerg, 29 18

Sodium Hyposulphite—
Christiania, 6 c.
Montreal, 1 t. 5 c.
,, 14

Salammoniac—
St. Petersburg, 10 t. 9 c.

PRICES CURRENT.

WEDNESDAY, July 2, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/3		
,, Glacial .. .. ,,	64/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3¾
Picric .. .. ,,	0	1	1
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2½
Arsenic, white powdered .. .. per ton	13	0	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	10	0
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	15	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	7	6
,, ,, (grey), Hull .. .. ,,	11	7	6
Aniline Oil (pure) .. .. per lb.	0	0	10½
Aniline Salt ,, ... ,,	0	0	9
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	4	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	13	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	2	6
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	3	9
,, 50/90 ,, ... ,,	0	2	9
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7½
,, (crude 60°) .. .. per gallon	0	2	2
Creosote (ordinary) .. .. ,,	0	0	3
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	8	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2½
Copper (Chili Bars) .. .. per ton	57	10	0
,, Sulphate .. .. ,,	22	0	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	10	0
,, Litharge Flake (ex ship) .. .. ,,	15	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	22	0	0
Lime, Acetate (brown) .. .. ,,	7	7	6
,, ,, (grey) .. .. per ton	13	0	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	1½
Oils:—			
Cotton-seed .. .. per ton	22	10	0
Linseed .. .. ,,	26	0	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5⅝
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	4
,, Carbonate, 90% (ex ship) .. .. .. per ton	19	10	0
,, Chlorate .. .. per lb.	0	0	4½
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	22	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	21	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	20	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	3	11 11/16
,, Nitrate .. .. ,,	0	2	8
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	0	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	2	6
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	5	0
,, ,, (Soda Crystals) .. .. ,,	2	15	0
,, Acetate (ex-ship) .. .. ,,	15	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¼
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	3
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	9	15	0
,, ,, (74 % Caustic Soda) ,, .. ,,	9	10	0
,, ,, (70 % Caustic Soda) ,, .. ,,	8	15	0
,, ,, (60 % Caustic Soda, white) (f.o.b.) ,,	7	15	0
,, ,, (60 % Caustic Soda, cream) ,, ,,	7	7	6
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	1½
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	3	17	6
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	7	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8
,, Barium, 95 % .. .. ,,	0	0	5¼
,, Potassium .. .. ,,	0	0	8¼
Sulphur (Flowers) .. .. per ton.	7	10	0
,, (Roll Brimstone) .. .. ,,	6	0	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	10	0
Tin (English Ingots) .. .. ,,	97	10	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	0	0

THE

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"NITROGEN: ITS USES AND SOURCES IN AGRICULTURE."*

THIS little booklet has much to recommend it to the notice of the Trade. It consists of a collection of valuable statistics concerning the nitrogenous manure trade, and contains in addition some useful information as to the sources of gain and loss of nitrogen in agriculture.

Considering the absolute necessity of nitrogenous vegetable matters to the life of animals, and the ever-increasing population, which must be fed on a proportionately ever-decreasing vegetation, the problem as to whether we are properly husbanding the world's supply of available nitrogen is of an importance which cannot be over-rated.

For the last fifty years it has been generally agreed that while plants can obtain all their carbon from the carbon dioxide in the atmosphere, they cannot make use of the superabundance of nitrogen in the same source. So that when combined nitrogen once becomes converted into free nitrogen it is practically lost to vegetation; for it is only by processes which are much too slow for the rapid demand that the free nitrogen is again brought into an available form.

Wasteful consumption of nitrogen is, then, almost as culpable as wasteful consumption of coal, as far as its ultimate recovery is concerned, and far more culpable as far as its necessity to man is concerned.

According to the above tenets, plants must take up all the nitrogen they require from the soil, and it has been shown that, even here, nitrate is the only form in which it can be readily absorbed. It is a curious reflection that the life of man should thus hang upon the life of the microscopical nitrifying organisms which convert nitrogenous organic matter into nitrates. Luckily, there is still a plentiful supply of nitrogenous organic matter for the nitrifying organisms to work upon; for we learn, on page 16, that in all ordinary soils there is seldom less than 3,500 lbs. of such nitrogen per acre to a depth of one foot, and in rich soils often double that amount, while, of course, there is a vast supply below the depth of one foot. Moreover, we may take comfort from Sir John Lawes' calculations, quoted on page 43, which show that, when all known sources of loss and gain are considered, the amount of nitrogen probably lost per annum is only about 15 to 20 lbs. per acre.

But a change has been coming over the scientific horizon during the last few months; for our highest authorities on these subjects, Lawes and Gilbert, have been repeating the experiments which the Germans, Hellriegel and Wilforth's, have been conducting for the last five years. These experiments go far towards proving that certain heretofore mysterious tubercles, which form upon the roots of leguminous plants, contain micro-organisms which are capable of taking up atmospheric nitrogen in some at present inexplicable way, and of transferring it to the roots in a form which they can absorb. If such be really the case, some practical experiences which have long been wanting explanation will be cleared up; we refer to the curious way in which nitrogenous fertilisers have always failed to do much good to leguminous crops, notwithstanding that they are so beneficial to all others; and to the fact that although leguminous crops remove more nitrogen from the soil than most others, yet they leave it richer in that food.

A never failing source of nitrogen for our crops is thus rendered possible; but, as our author points out, it would be rash to conclude on the strength of their comparatively few experiments that we need no longer take care for the morrow, and may lavishly expend our nitrogenous substance.

* A Lecture delivered before the British Chemical Manure Manufacturers' Association in London. By C. M. Aikman, M.A., B.Sc., etc.—Glasgow, C. L. Wright 100, West George-street.

The greatest source of loss of nitrogen to our soil is our system of sewage disposal, by which all the excreted nitrogen of the inhabitants of towns is washed into the sea. It is estimated that an amount of nitrogen equivalent to 734,172 tons of sodium nitrate were removed from the soil in the total wheat, barley, and oats crops of Great Britain in 1889; only so much of this as existed in the portion of the crops which was consumed on the farms producing them, can be relied upon as having been returned to the soil; the rest being, as we have already said, washed into the sea, whence but very little returns as sea-weed and fish manures.

Another source of loss—one which a less careful observer than Mr. Aikman would have failed to draw our attention to—is the nitrogen used in making explosives; it appears that some 10,000,000 lbs. of nitrogen are being yearly converted into the free state owing to the necessity for blasting rocks and maintaining standing armies.

The various nitrogenous manures, by means of which nitrogen is returned to the soil, receive ample consideration. It is to be noted that Peruvian guano is practically exhausted, and the much smaller quantities which we now import are much poorer in nitrogen than the earlier imports were. Nitrate of soda, too, is less imported now than it was 15 years back, notwithstanding its rapid fall in price. It is to be hoped that it will grow much cheaper soon; for we believe that the price of ammonium sulphate will fall with it. The manufacture of this last-mentioned manure is steadily increasing, and, if only Mr. Ludwig Mond's experiments on the recovery of nitrogen from coal during its combustion could be realised, vast amounts of ammonium sulphate would be obtained.

When all nitrogenous manures are taken into account, it is found that, notwithstanding that the price of nitrogen has fallen during the last fifteen years from 20s. to 10s. per unit, we now use only some 28,000 tons of it for manurial purposes, whereas we used some 34,000 tons fifteen years ago. Although this can be somewhat accounted for by the fact that more grazing is done now, more nitrogen used as feeding cakes and subsequently made into farmyard manure, yet we cannot help agreeing with Mr. Bernard Dyer that much land must be under-farmed at the present day. This chemist has calculated that if the moderate dressings of ¾-cwt. of nitrate of soda per acre had been applied in 1889 to the total area on which wheat was cultivated, and of 2 cwt. per acre to the total area on which mangels were grown, more than 35,000 tons of nitrate would have been used, whereas, as a matter of fact, about 10,000 tons only were used.

And does this under-farming arise from ignorance? Educate the farmers, is the popular cry of the present day; technical education is said to be neglected in this country. Yet 50 years have passed since the Royal Agricultural College was founded at Cirencester, and within the last ten years half-a-dozen imitators have sprung into being; can this be said to be neglect?

No, we are inclined to attribute more to the enormous impetus which trade received by the discoveries at the beginning of the present reign. Ever since, there has been a rush to fortune-making pursuits, and agriculture has been deserted. Now that we are closing factories and disputing with our "hands," more of us will turn to the oldest of trades, and the use of nitrogenous manures will go up with a bound.

Meanwhile, the chemical manure manufacturer may do much; let him improve, cheapen, and push his wares to the utmost; and, as a preliminary step in the right direction, we can conscientiously recommend him to peruse Mr. Aikman's little pamphlet.

Jalap Resin.— Prof. Fluckiger accounts for the noticed decreasd yield of jalap resin in the last twenty years by the partial extraction of the resin by means of alcohol before the jalap is placed upon the market (*Am. Journ. Pharm.*, 1890, 141). Bellingrodt has observed no diminution in the yield of jalap resin; he publishes results of assays made in 1851-1854 with an average yield of 11·58 per cent. and the average for the last thirty years he gives as 11·60 per cent. E. Dieterich finds the yield for the last two years to have been 7·1, 7·7, 6·6 and 8·1 per cent., confirming Fluckiger's statement. These last figures have reference to official resin and not to total extracts oluble in alcohol; in the last lot examined by him the total amount soluble in alcohol was 14 per cent., while the official resin was only 8·1 per cent.—*Oil, Paint and Drug Reporter.*

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Bracher and Co., Wincanton.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Brunner, Mond and Co., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Buckley.—Fireclay ware of all kinds—Slabs, Blocks, Bricks, Tiles, "Metalline," &c.

Chadderton Iron Works Co., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, Plaistow, Essex.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

Galloways, Limited, Manchester.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters.

Joseph Kershaw and Co., Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsay and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Meldrum Bros., Manchester.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.—Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

Official Memoranda.

CONSULAR REPORTS.

COCHINEAL.

The Belgian Consul-General in the Canary Islands devotes a very considerable portion of his report to cochineal, describing in detail its production, the different commercial classes of the product, and its analysis, also enumerating the various substitutes which are now in use in place of cochineal, as well as a tabular statement of the exports, price per pound, and total value for each year from 1831 to 1888. In 1831 only eight pounds were exported, for a value of 80 francs; the maximum export was reached in 1869, when it amounted to 6,076,869 lbs. for 19,749,824 francs, fluctuating then for several years between four and five million pounds, declining in 1886 to 2,330,947 lbs., in 1887 to 2,169,341 lbs., and in 1888 to 1,735,200 lbs.—(*Recueil Consulaire*, vol. lxix., part 4, 1890.)

PUMICE STONE.

The same Consul-General states that a very important mine of pumice stone exists on the Teneriffe Peak, of which the working was only started in 1888. The stone is found in that part of the peak called the "Canadas," at about 2,000 feet above sea level, which has an area of some 6,000 hectares, out of the middle of which rises the highest part of the peak. The Russian Consul at St. Croix, bought this property of the Spanish Government in consideration of an annual payment for the pumice stone working. The Russian Consul has associated himself with a Belgian, and they, under the firm styled Aguilar and Valcke, commenced operations in 1888, but it was only last year exportation was really started. At the Paris Exhibition, the Consul-General states that this stone obtained a silver medal, and in view of the requirements of England, France, and America, he believes it will develop a trade of great importance before many years. So far, the Lipari Islands have practically furnished the world's supply of this product, exporting about 100,000 tons per annum. The Teneriffe stone being recognised as of excellent quality, and its extraction being a much more simple matter than in the Lipari Islands, it follows that the price is much less. More capital will, however, be wanted to extend the working operations.—(*Recueil Consulaire*, vol. lxix., part 4, 1890.)

OZOKERIT.

The Belgian Consul-General at Vienna remarks on the great progress which has been made since 1886 in the working of the ozokerit mines in the neighbourhood of Boryslav (Galicia). These mines, which, for the most part, have so far been worked in a very primitive manner, and have been in the hands of men who were generally in want of money and knowledge, have nearly all been taken over under a preliminary convention that the privileged I. & R. Austrian Société for Commerce and Industry at Vienna has concluded with the intention of working them properly by means of a powerful company. The primitive methods of working raised the production from 89,000 quintals in 1883 to 108,000 metric quintals in 1889. The average price is twenty-eight florins per 100 kilogs. delivered at Boryslav, but it rose in the course of 1889 to thirty-eight florins, by reason of considerable purchases for England. The competiton of other mines is not felt at present. Ozokerit has been found also at Pomiarki (Galicia). The production of the Utah mine (North America) rose from 65,000 lbs. in 1888 to 130,000 lbs. in 1889, and a second deposit has been discovered. The producers in Galicia fear for the future of their export trade, which rose from 11,965 quintals in 1883 to 69,495 quintals in 1888.—(*Recueil Consulaire*, vol. lxix., part 3, 1890.)

ENFORCING FOREIGN JUDGMENTS IN ITALY.

Mr. Vice-Consul de Zuccato, of Florence, says cases frequently occur of British people having to enforce a sentence in Italy, against foreign subjects, obtained from a legally constituted court in England, commencing proceedings anew in Italy, in accordance with the local laws, thereby incurring a heavy expenditure, with a doubtful probability of success. Whenever a sentence against foreigners is legally pronounced by a duly constituted court in England, the enforcement of the same in Italy may be demanded by the Court of Appeal in the jurisdiction of which the sentence is to be put into execution, on production of the original documents duly legalized by an Italian Consul. The Court of Appeal will examine if the sentence has been legally issued, and if all the required formalities with respect to the serving of summonses, &c., have been observed; and, if there is nothing in the sentence against public order or public right, the Court will issue a decree giving the same force to the judgment as if it had been delivered by an Italian tribunal. This mode of proceeding, which would appear to be little understood in England, or at any rate imperfectly used, is called "Guidizio di Delibazione." The Court of Appeal at Venice has jurisdiction over all the Venetian provinces.—(Annual Series, 1890, No. 641.)

DETERMINING FREE ACIDS IN OILS.

GEISSLER'S method, consisting in dissolving the oil in ether-alcohol and titrating it with decinormal alcoholic (50 per cent.) alkali, is accurate and can be used in all cases, save where the oil is so dark coloured as to hide the change of the indicator (phenolphthalein) used. By employing a cylinder about 4 cm in diameter instead of a flask, this difficulty is much lessened. The process is especially suited for clear mineral oils. Burstyn's plan of shaking the oil with an equal volume of alcohol, drawing off and titrating an aliquot portion, is fallacious, as the whole of the free fat acid is only extracted by repeated treatment with alcohol, and thus the results are low when compared with those given by Geissler's method; *e.g.*, a refined rape oil containing 0·730 per cent. of acid, calculated as SO_3, gave only 0·374 per cent. when thus treated. Merz shakes the oil with alcohol in a stoppered flask and titrates the mixture with repeated agitation. This gives accurate results, and is well adapted for oils containing a considerable quantity of free fat acid, as if treated by Geissler's method they require an inconveniently large amount of alcohol to prevent the oil being precipitated from its ethereal solution by the standard caustic alkali in weak alcohol. Burstyn's physical method, which consists in shaking the oil with alcohol of known specific gravity and deducing the quantity of fat acid it extracts by the increase in density it suffers, is quite untrustworthy; *e.g.*, an oil containing 0·091 per cent. of acid, calculated as SO_3, gave 0·280 per cent. Many causes conduce to this result; among them may be mentioned the different specific gravities of the acids extracted, the error caused by the presence of a mineral acid, such as sulphuric acid, and the varying quantity of neutral oil dissolved. The following method is adapted for opaque mineral oils: 25 c.c. of the oil is shaken with 50 c.c. of absolute alcohol in a stoppered cylinder about 2 cm. in diameter, and the mixture allow to settle; 25 c.c. of the alcohol is then drawn off, 10 c.c. of ether added if turbid, and titrated with decinormal caustic soda. If more than 2 c.c. be used, the rest of the alcohol is poured off, another 50 c.c. added, and the process repeated. The free acid has been calculated as SO^3 throughout for the sake of uniformity.—*Oil and Colourmans' Journal.*

THE AIR MOISTENING OF MILLS AND FACTORIES.

A FEW days ago, a party of gentlemen interested in the Lancashire cotton trade, and mechanical experts from different parts of the country, paid a visit to the Hurst Mills, Ashton-under-Lyne, for the purpose of examining a new system of air moistening and ventilation for factories, mills, public buildings, &c. The new method of moistening, or steaming, is obtained by means of the "Aërophor Air Moistener," an apparatus which distributes moisture in the form of a very fine water cloud, either warm or cold. The water, which is pure and filtered, is propelled through a spray. The apparatus contains in itself no movable parts, and is, independent of number, worked by a high pressure pump. It consumes from two to two and a half gallons of water per hour, which is all absorbed by the atmosphere, and is capable of humidifying from 35,000 to 40,000 cubic feet to any desired degree. The introduction of the "moistener," which is a German invention, is chiefly the result of the Steaming in Weaving Sheds Act. The "moistener," which may be used either with or without an "Aërophor" ventilator, is said to be an excellent means of improving the health of the workpeople, making the atmospheric condition of the workroom more agreeable, without the noxious vapours created by the use of steam. It is also claimed to not only improve the output of cloth in mills in which it is in use, but also to improve the quality of the fabrics by rendering them more even, smooth, and brilliant. Saturday's inspection confirmed in every way the statements of the agents of the apparatus, both manager and workpeople expressing much satisfaction at its use. The weaving shed contained 480 looms, in which five moisteners were placed. As far as temperature was concerned, without considering the improvement in quality of cloth, 8 to 10 degrees less than was the case without the moisteners were registered. The members of the party were unanimous in approving its adoption. Some ten thousand installations have been made in Germany, and a number of the largest manufacturers in Lancashire and Yorkshire are giving the system a trial. The sole agents for this country are the United Kingdom Engineering Company, whose branch office in Manchester is at 17, Victoria Street.

NITRATE OF SODA.

MESSRS. Laird and Adamson, of D 5, Exchange-buildings, Liverpool, have just issued their half-yearly summary. From it it appears that during the past six months consumers have had every reason to be satisfied with the course of the various nitrate markets, for never have prices ranged so much in buyers' favour as they have during this period. There has been an enormous increase in the European consumption, but even had prices been 10s. to 20s. per ton higher, the increase in the consumption would also have gone on as it has done, and the producers received more benefit from the increased demand, which appears to be rather of natural growth than stimulated by cheapness. In five years the figures for the first six months have doubled themselves, the consumption of Europe in 1885 being 298,700 tons, against 587,400 tons in 1890. It is evident that at the range of prices accepted since January most producers must work at a loss, for a delivered price of £8. per ton, less charges, freight, loss in weight, and West Coast duty shows that producers only benefit to the extent of about £2. 12s. 6d. to £2. 15s. per ton, to manufacture, bag, place f.o.b., pay other expenses on West Coast, also management in this country, and as the future entirely depends on the shipments from the West Coast, it now remains for producers to declare frankly at what rate these shipments will continue, for as long as buyers are uncertain as to the supply their operations will be necessarily hampered. The fluctuations during the past six months have been slight, and to-day the nearest value for cargoes are 8s. to 8s 1½d for ordinary off coast and due, 8s. 1½d. to 8s. 3d. for May-June, 8s. 4½d. to 8s. 5d. for June-July, 8s. 6d. to 8s. 6½d. August-September, and 8s. 7½d. October-November sailings, all one rate United Kingdom or Continent. On the West Coast, according to recent advices, the price of nitrate was $2·50 per quintal, exchange 23⅝d., and freights 38s. 9d. per ton, United Kingdom or Continent, while last year nitrate was $2·65 per quintal, exchange 25¾d., and freights 36s. 3d. per ton.

Trade Notes.

TURPENTINE FORESTS.—Turpentine forests are divided into "crops" of from eight to ten thousand trees. Two men can box a crop in a week or ten days. The axe used has a long narrow bit, and the hole cut—which must be on the sunny side of the tree, and about two feet from the ground—is some eight or ten inches across the face, four deep, and shaped somewhat like the buckets of a grain elevator. Each contains from a pint to a quart of turpentine a week from the cutting, and they are then "cornered," which means that the corners are chipped to expose more fresh surface to the sun. Every week after this they are "chipped" or "hacked," that is, strips of bark some three inches wide are removed, so that the bared surfaces converge toward the box like spokes toward a hub, and lead the gum down into it. These naked strips are afterward continued up the tree with a spud-like tool, having a handle some ten or twelve feet long, to the height of twenty feet, which is as high as trees can be worked. This process is called "pulling." Meantime the "dippers" have gone around visiting each tree, about once a week, to dip the turpentine into buckets and empty it into barrels placed here and there. One negro can perform one of these various processes for a crop in a week, so that as many men are required to work a crop as there are distinct processes going on. A competent white superintendent "rides the woods" to see that everyone does his work properly. A store and distillery at the nearest convenient point on the railway complete the outfit. After a forest has been worked over on one side it is "back-boxed"—that is, the same operations are carried on upon the other side of the trees. As much Turpentine is often secured at this second working as at the first, but it is not of so good a quality. After this the trees are of no further use except for lumber or shingles, and when a forest of the long leaf species is thus cut off it is followed by the short leaf, which does not yield turpentine.—*Oil and Colourman's Journal.*

MINES.—Four Blue-books are just published containing further reports for the year 1889 of Her Majesty's inspectors of mines to the Secretary of State. Mr. J. T. Robson deals with the South Wales district, where there are 345 mines of various kinds at work—nearly all collieries—in the hands of 234 firms. Out of 20,664,586 tons of minerals produced, 20,458,398 tons were coal. This was the largest quantity ever produced in one year in the district, and was greater by 732,753 tons than the quantity of the year before. The number of persons employed was 73,451, of whom 7,299 boys from 12 to 16 years of age were employed underground, and 27 girls from 13 to 16 and 406 women above 16 were above-ground workers. There were 146 accidents and 153 deaths caused thereby in the district, these figures being nearly the same as in 1888. In the south-western district, for which Mr. J. S. Martin is the inspector, the total number of persons employed in and about 289 mines was 38,154, of whom 32,651 were below-ground. The total quantity of minerals raised was 9,972,983 tons, which 9,841,905 tons were coal. The total number of fatal accidents was 59, by which 65 persons were killed and nine others injured. Mr. Martin notices that there has been considerable improvement in the treatment of animals in this district. Mr. F. N. Wardell reports that the number of accidents in the Yorkshire and Lincolnshire district was 101 (only one of them in Lincolnshire, causing one death), resulting in the loss of 106 lives. The amount of minerals raised was 22,457,749 tons, and the number of persons engaged was 70,062. Of the minerals 21,973,400 tons were coal. These numbers are considerably above those of 1888. In the East Scotland district, Mr. J. B. Atkinson states that 44,680 persons were employed in raising 16,442,953 tons of minerals; that the number of fatal accidents was 57, and of deaths 119. Of the minerals, 13,682,601 tons were coal. There were 75 girls between 13 and 16 and 558 women above above 16 employed above-ground in the district.

MEDICATED LIQUID SOAPS.—In a paper read before the recent congress of Russian Pharmaceutical Societies, Herr Saidemann called attention to the therapeutic value of liquid soaps, which he claimed to present the advantages of being more suitable for inunction, favouring admixture of medicinal substances, and being always producible from vegetable oils, thus avoiding the use of animal fats. The formula recommended by him for a liquid soap is to mix one part of caustic potash dissolved in an equal weight of water with four parts of olive oil and one-fourth part of alcohol, and shake it vigorously during ten minutes. The mixture is repeatedly stirred during the next hour, then mixed with an equal quantity of water, and after standing several days filtered. The author states that carbolic acid incorporated with a potash soap has its caustic and poisonous properties paralyzed, while its disinfectant action appears to be increased. It is also stated that the Berlin District Sanitary Commission has found a solution of potash soap in 10,000 of water completely to prevent the development of the splenic fever bacillus, and has recommended a solution of fifteen parts in 10,000 as one of the best disinfectants.

STATE OF THE SKILLED LABOUR MARKET.—The following memorandum has been prepared for the *Board of Trade Journal* by the Labour Correspondent to the Board of Trade:—With but a few exceptions the reports issued this month by the leading trade societies indicate a still highly prosperous condition of trade, and, but for the numerous labour disputes which have broken out in May, the percentage of unemployed labour in those trades sending in returns would have been somewhat reduced. The trades which show improvement are the iron-making branches of the engineering trade, the pattern-making departments show some falling off; the general proportion of unemployed engineers, however, has fallen from 2·3 to 1·8 per cent. The building trades also continue to show improvement, and the percentage of unemployed is but 1·6 as against 2 last month. The ship-building trade shows a slight falling off from the figures of recent months, though the increase of men out of work is not 1 per cent. upon the figures of the previous month. The list of strikes is very heavy, and 106 have been recorded during the month. None of these disputes have, however, been of great importance, and most of them have already been brought to a termination.

LEEDS GAS STRIKE.—The dispute between the Gas Committee and the workmen has been settled. The terms are, to put them briefly, as follows: The Gas Committee proposed to give the stokers three fires each to attend to, this being fresh work, but to take off the wheeling of coke and ashes by employing labourers for that work. The men objected strongly to this alteration, and, under the conciliation scheme, separate firemen are to be employed, and things remain as settled by the concessions last October. The second point at issue was the question of holiday. The men last year got a week's holiday in the year, with pay granted to each permanent hand. This applied only to about 25 per cent of the men; and, instead, it is now agreed to allow double pay if working, and single pay if not working, to all the workmen for Good Friday, Whit-Monday, Bank Holiday Monday, and Christmas Day. The third issue was on the question of the signing by the men of the agreement in September, of each year to work during the months of October, November, December, and January. This has been knocked on the head, and the men will be free to leave work at any time. The men have also agreed that in each shift they will stoke three tons of coal instead of 55cwt., as heretofore. The following are the terms of agreement entered into between the Leeds Gas Committee and the men who have been working during the lockout: Every man who did not sign the agreement to receive £2. 10s.; those who had signed for three months to receive £5.; those who had signed for twelve months, £7. 10s. In addition they are to receive full pay for the work done, and their railway fares are to be paid to the town from whence they came. The terms of the settlement, it is stated, meet with general approval.

BUANDERINE.—This is a new lixiviative, which has made its appearance on the German market, for washing and cleaning linen goods especially, and great things are claimed for it, but whether the claims are substantiated is somewhat uncertain and very doubtful, to judge from its composition, which is given in a contemporary as 53·95 fatty acid, 12·25 paraffine wax, 7·58 soda, 1·26 alkaline sulphate, 24·96 water.

THE INLAND NAVIGATION CONGRESS.—The Fourth International Congress on Inland Navigation will be held in Manchester, on July 28th and following days. The objects of the Congress are:—To promote the improvement of Inland Navigation, and of Estuaries. To direct attention to the economical value of Navigable Waterways. To examine, generally, technical questions relating to the construction and working of Canals. To receive the report of the International Statistical Commission appointed at the last Congress; and to take further steps towards the collection of statistics bearing on Inland Navigation. The work of the Congress will be divided into two sections:—Section 1. Engineering, dealing with Inland Canals and Canalised Rivers; Traction and Propulsion on Canals; Ship Canals; The Improvement of Tidal Rivers; Dredging and Excavating. Section 2. Trading and Economy, dealing with:—Report of The International Statistical Commission; the Condition, Management, and Cost of Working of Inland Navigation in various countries. Subject C.—The present position as regards Finance and Traffic of Inland Navigation in the United Kingdom, and what means can best be taken for its improvement. Subject D.—The Cost of Transport on Canals as compared with Railways, and the Mutual Influence of Railways and Canals on each other. Subject E.—The extent to which the State should assist or share in the development or management of Inland Navigation traffic.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Improved Furnace. E. F. Edgar. 9,703. June 23.
Moistening Air in Factories. W. M. Porter and A. L. Lewis. 9,704. June 23.
Smoke Consumption. J. Whitehead. 9,707. June 23.
Rendering Textile Fabrics Waterproof. J. Miller, Senr. and J. Miller, Junr. 9,711. June 23.
Refrigerating Apparatus. J. Price and M. C. Bannister. 9,716. June 23.
Air-filter Plug. G. Danninger. 9,722. June 23.
Liquid Meters. J. S. Raworth. 9,731. June 23.
Manufacture of Illuminating Gas.—(Complete Specification). S. Pitt. 9,733. June 23.
A New Alpha-beta Napthylendiaminmonosulpho Acid. J. Dawson and R. Hirsb. 9,768. June 24.
Apparatus for Removing "Burr" from Wood and other Fibre. F. Illingworth. 9,771. June 24.
Manufacture of Alkaline Carbonates and Acetone.—(Complete Specification). F. W. A. Frerichs. 9,793. June 24.
Water Filters. W. J. Baker. 9,802. June 24.
Apparatus for Drying Fibrous Materials. F. Wever. 9,805. June 24.
Pulverizing Machinery.—(Complete Specification). H. H. Lake. 9,809. June 24.
Dressing Millstones.—(Complete Specification). O. Imray. 9,815. June 24.
Vulcanized Plastic Compounds.—(Complete Specification). A. J. Boult. 9,822. June 24.
Extraction Apparatus. A. J. Boult. 9,825. June 24.
Steel Melting Furnaces. D. Rennie. 9,830. June 25.
Ice-making Apparatus. D. Stevenson. 9,843. June 25.
Moistening Air in Factories. F. Wilkinson and C. E. Wilkinson. 9,850. June 25.
Centrifugal Liquid Separators.—(Complete Specification). P. M. Sharples and D. T. Sharples. 9,852. June 25.
Bleaching Wax. G. Anderton, G. T. Barlow and T. G. Marsh. 9,856. June 25.
Electric Welding.—(Complete Specification). M. W. Dewey. 9,857. June 25.
Electrical Storage Batteries. A. J. Boult. 9,861. June 25.
Apparatus for Measuring Air Currents.—(Complete Specification). W. W. Horn. 9,882. June 25.
Apparatus for Indicating Increase of Temperature due to Friction. E. C. C. Stanford. 9,895. June 26.
Chimney Tops.—(Complete Specification). G. Tweedy. 9,896. June 26.
White Lead Pigments. do. J. Gordon. 9,897. June 26.
Coal-washing Machinery. A. F. G. Brown. 9,899. June 26.
Manufacture of Sodium and Potassium. A. Philips. 9,900. June 26.
Electric Armatures. W. H. Clarke. 9,904. June 26.
Manufacture of Tin and Terne Plates. C. A. Burghardt. 9,906. June 26.
Purifying Alcoholic Liquids. D. A. Boullanger and A. Scheunert. 9,910. June 26.
Manufacture of Dehydromethyl-phenyl-pyrazine. O. Imray. 9,923. June 26.
Manufacture of Alkaline Carbonates and Bye-products. A. G. Haddock and J. Leith. June 26.
Apparatus for Drying Aqueous Matter.—(Complete Specification). R. Haddan. 9,941. June 26.
Electric Heating. R. Kennedy. 9,956. June 27.
Humidifying Air. J. Moseley. 9,959. June 27.
Smoke Consumption. J. Hinton and A. A. Hinton. 9,972. June 27.
Separating Liquids from Semi-liquids and Solids. J. F. Brinjes. 9,983. June 27.
Manufacture of Iron by Electrolysis. T. Parker. 9,991. June 27
Manufacture of Sodium Ferride and Caustic Soda. F. Ellershausen. 9,997. June 27.
Ventilation by means of Ozonised Air. M. P. Halschik. 9,999. June 28.
Water Gauges for Steam Generators.—(Complete Specification. J. Stock. 10,007. June 28.
Apparatus for Promoting the Circulation of Water in Boilers. G. E. Belliss and A. Morcom. 10,015. June 28.
Annealing Glassware. D. Rylands. 10,018. June 28.
Manufacture of Porous Earthenware Building Material. J. P. Bayly. 10,036. June 28.
Electrolytic Treatment of Metals. A. Watt.. 10,038. June 28.
Chimney Tops J. J. Bosworth. 10,043. June 28.
Filter and Heater for Steam Boilers. W. W. Horn. 10,045. June 28.
Production of Colouring Matters. O. Imray. 10,047. June 28.
Production of Hydro-carburetted Air. G Wilkinson. 10,051. June 28.
Steam Traps. F. E Blackmore. 10,055. June 28.
Utilization of Waste Oxide of Iron. J Bradbury. 10,062. June 30.
Manufacture of Trioxy-benzo-phenone. J. Y. Johnson. 10,095. June 30.
Production of Azo Colouring Matters. O. Imray. 10,101. June 30.
Purifying Double Carbonate of Potassium and Magnesium. H. Precht. 10,115. June 30
Electric Welding.—(Complete Specification). M. W. Dewey. 10,123. June 30.
Electric Heating. do. do. do. 10,124. June 30.

New Companies.

AUTOMATIC COAL GAS RETORT COMPANY, LIMITED.—This company was registered on the 1st inst., with a capital of £250,000., in £1. shares, to purchase letters patent relating to improvements in gas retorts, upon terms of an agreement of the 10th June (unregistered) with the Retort Syndicate, Limited, and the Coze Syndicate, Limited. The subscribers are:—

	Shares.
F. Spooner, 83, Rendlesham-road, N.E., insurance agent	1
J. Barlock, 25, Sebert-road, E., insurance broker	1
W. Parker, 10, Rosslyn-hill, Hampstead	1
P. Hildesheim, Lyndhurst-gardens, Hampstead	1
J. S. Standen, 60, Moray-road, N	1
W. Dauney, 6, Lexham-gardens	1
H. Smith, 26, Park-place, Leyton	1

CARBONIC ACID GAS COMPANY, LIMITED.—This company was registered on the 26th ult., with a capital of £80,000., in £5. shares, 4,000 of which are preference shares, to acquire the lease of a factory and premises at Lea Bridge-road, Hackney, held by Rudolf Stökvis, and others, and the plant, stock-in-trade, and other assets of the business of manufacturer of liquid carbonic acid gas, now carried on by the said Rudolf Stökvis. The board will issue £6. per cent. debentures for securing £20,000., part of the purchase money. The subscribers are:—

	Shares.
Solomon Raphael Stökvis, junr., Rotterdam	1
A. N. Polak, Rotterdam	1
C. G. Rommenhœller, Rotterdam, merchant	1
F. M. Bentley, 17, Rumsey-road, Brixton, manufacturer	1
C. Roth, 24, Bushby-road, Camden-road, manufacturer	1
H. Steinem, 3, Urswick-road, Clapton	1
Rudolf Stökvis, 3, Urswick-road, Clapton	1

GOODLASS, WALL AND COMPANY, LIMITED:—This company was registered on the 1st. inst., with a capital of £50,000., in £10. shares, 1,000 being preference shares, to take over the business of the firm of Goodlass, Wall and Co., of Old Swan, near Liverpool, manufacturers, miners, and merchants of paints, colours, varnishes, and chemical substances. The subscribers are:—

	Shares.
H. D. B. Wall, 42, Seel-street, Liverpool, chemical manufacturer	1
G. R. Leah, 42, Seel-street, Liverpool, chemical manufacturer	1
F. T. Leah, 42, Seel-street, Liverpool, chemical manufacturer	1
F. Bentley, 42, Seel-street, Liverpool, chemical manufacturer	1
H. Leah, 42, Seel-street, Liverpool, chemical manufacturer	1
Mrs. M. Wall, Wallasey, Cheshire	1
Mrs A. E. Leah, Liscard, Cheshire	1

PASCOE, GRENFELL, AND SONS, LIMITED.—This company was registered on the 2nd inst., with a capital of £200,000., in £10. shares, whereof 10,000 are 4 per cent., cumulative preference shares, to take over the business of smelters, rollers, refiners, and manufacturers of, and as merchants and dealers in copper, yellow metal, spelter, and other metals and ores, and of colliery owners, and manufacturers of chemical substances, carried on by Pascoe, Grenfell and Sons, London, Swansea, Liverpool, and elsewhere. The subscribers are:—

	Shares.
C. S. Grenfell, 27, Upper Thames-street, copper merchant	1
A. R. Grenfell, 27, Upper Thames-street, copper merchant	1
W. H. Grenfell, 27, Upper Thames-street, copper merchant	1
C. G. Grenfell, 27, Upper Thames-street, copper merchant	1
A. F. Walrond, 27, Upper Thames-street, cashier	1
J. P. Grenfell, 69, Easton-place	1
R. F. J. Grenfell, Hill House, Taplow, Bucks	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

FRANKLAND AND OLLERENSHAW, Linthwaite, near Huddersfield, oil and soap manufacturers.
F. FRANCE and A. JACKSON, under the style of J. Jackson and Sons, Bolton, mining engineers.
GOTTWALTZ and LIND, Paignton, brewers.
J. & R. HANSON, Blackburn, paper manufacturers, as far as regards R. H. Hanson, deceased.

THE BANKRUPTCY ACT, 1883.

Adjudications.

MICHAEL GIBSON, Dalton, Kingston-upon-Hull, drysalter.

Market Reports.

THE LIVERPOOL COLOUR MARKET.

Colours remain unchanged. Ochres: Oxfordshire quoted at £10, £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc: V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

MISCELLANEOUS CHEMICAL MARKET.

There has been a very satisfactory amount of business done during the past week, and the enquiry for most chemicals has been good. Prices, however, on the whole remain about the same. Bleaching powder is in better demand at last week's figures, viz., £4. 12s. 6d. to £4. 15s. (softwood), rails; and £5. to £5. 5s. (hardwood), f.o.b. Soda ash is somewhat easier, prices, however, unaltered. Caustic soda scarce and in good demand, at £8. 15s. to £8. 17s 6d. for 70%; £7. 15s. to £7. 17s. 6d. for 60%, and £7. for cream 60%, all rails, makers works. Soda crystals quiet. Saltcake has had good sale at about 26s. 6d. rails, Widnes, St. Helens. Caustic and carbonate of potash sell freely and makers are well supplied with orders, no change in price. Lead salts are steady but difficult to move; we quote Foreign white acetate £24., c.i.f.; English, £28. 10s.; nitrate, £22. Sulphate of copper is still easier and the demand is but moderate, £21. generally quoted; something under this would probably buy. Bichromates reduced ¼d. per lb. We quote potash 3¾d.; soda 2¾d. Oxalic acid in fair request, at 3½d. to 3¾d. Chlorate of potash rather firmer at last week's prices. Acetates of lime and acetic acid are in but poor demand and without change in values. Carbolic acids rather more enquired after, both prompt and forward; for the latter delivery, makers are not eager to sell, except at an advance on to-day's prices.

REPORT ON MANURE MATERIAL.

The half-year opens rather quietly, but prices for both nitrogenous and phosphatic material are very firm in all positions.

There is somewhat more enquiry for Charleston phosphate rock, and 10½d. for hot-air dried River, and 9½d. for Land, in cargoes cost freight and insurance to U.K., would probably still be business, though sellers show a disposition to advance their quotations. There are buyers of cargoes of 80% Florida rock at 1s. 3d. per unit, delivered good U.K. ports, but sellers do not appear to be able to ship extensively so far, and in any case something over 15d. would have to be paid for 80% grade. For Canadian, quotations remain about 1s. 3½d. for 80%, 1s. 2d. for 75%, and 12½d. for 70%, one-fifth rise in each case, delivered Thames, Mersey, and Clyde, but some concession would probably have to be made to induce any large business. Quotations for Somme, Belgian, and Osso phosphates are without alteration since our last report.

We do not hear of any further business in cargoes of River Plate bones, the ideas of owners of the only cargo offering being much too high. £5. 7s. 6d. could be readily obtained, and probably £5. 10s. is just now nearest value for June-July shipment. There is nothing further reported either in crushed East Indian bones or bone meal. Values for shipment must therefore be quoted nominally at £5. 5s. for crushed bones and £5. 10s. for bone meal. On spot, £5. 10s. is lowest for meal ex-store Liverpool. Some sales of Mediterranean bones have been made at £4. 15s., at which price there are still buyers. Some steamed Rio Grande shanks have been sold in Liverpool at £5. 15s. to £5. 17s. 6d. per ton.

Nitrate of soda is somewhat firmer, owing to advices of strikes at one of the shipping ports, and consequent cessation of shipments there. So far the market has improved about a 1d. for distant; on spot there is as yet no material change, though holders are less disposed to sell. Should the strike continue and extend, of course it will materially affect prices, and those interested will closely watch its progress. Spot price for nitrate may be still quoted as 8s. 1½d. for ordinary quality, 8s. 3d. for refined. Due cargoes have been sold at 8s. to 8s. 0¾d., according to size, but closing value for large cargoes is 8s. 1d. May-June shipments are worth about 8s. 3d., and September-October about 8s. 7½d. for ordinary quality, 3d. to 6d. more for refined.

There is nothing special to note in the market for dried blood. Buyers show little disposition to pay 10s. 6d. per unit of ammonia for home prepared, delivered f.o.r. at works. A small parcel of Rio Grande meat meal sold in Liverpool at 10s. 7½d. per unit of ammonia and 1s. 3d. phosphates. Fish guano is worth about 10s. per unit of ammonia and 1s. 3d. phosphates, f.o.b. or f.o.r. at works.

Ground hoof and horn (ammonite) may be quoted 8s. 6d. to 8s. 9d. per unit, according to grinding, f.o.r. at works.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

There is a marked improvement in several sections of the Scotch market to put on record this week. Sulphate of ammonia has been steadily rising, the price spot Leith to-day being quite £11. 7s. 6d., and the article is very firm, forward business having been done at £11. 12s. 6d. Caustic soda is very scarce and dearer all round, and bleaching powder also rises with the growing confidence in the prospects of the proposed general chemical syndicate, present f.o.b. Glasgow top quotation being now fully £5. The old-standing agreement between the Scotch makers of bichromates has not been renewed, as had been in some quarters expected, and each of the three is now for his own hand. The immediate results have been, first, an increase of discount to 7½ per cent. last week, and again, this week, a still more decided break of ¼d. a pound for both potash and soda, with the old rate of discount (5 and 6%) restored. This is a most important incident, and reduced prices now stand as given below; but a further reduction may be at hand. It is believed that makers' stocks have got too large, constituting one cause, perhaps the chief cause, of the lapse of joint action. Chief prices current are:—Soda crystals, 51s. net, Tyne; alum in lump £5., less 2½% Glasgow; borax, English refined, £29. 10s, and boracic acid, £37. 10s., net Glasgow; soda ash, 1¼d. less 5%, Tyne; caustic soda, white, 76°, £10. 12s. 6d., 70/72°, £9., 60/62°, £8, and cream, 60/62°, £7. 10s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s, and 1 cwt. casks, £6. net Tyne; refined alkali, 48/52°, 1½d., less 2½%, Tyne; saltcake, 26s. to 28s.; bleaching powder, £4 17s. 6d. to £5. 2s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5 and 6% to Scotch and English buyers respectively; chlorate of potash, 4½d., less 5% any port; nitrate of soda 8s. 1½d. to 8s. 3d.; sulphate of ammonia, £11. 7s. 6d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £20. 10s., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3¼d.; paraffin spirit (naphtha), 7d. a gallon; paraffin oil (burning), 6¾d. to 7d. on rails Glasgow to all Scotch buyers (English orders negotiable about 1¼d. a gallon lower); ditto (lubricating), 865°, £5. to £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's import of sugar at Greenock were 5,492 bags.

THE LIVERPOOL MINERAL MARKET.

Our market still maintains the firmness reported last week, and in some minerals a slight advance has taken place. Manganese: Arrivals continue smaller, and prices remain firm. Magnesite freely offering, and prices totally in buyers' favour. Raw lump, 26s., raw ground, £6. 10s., and calcined ground £10. to £11. Bauxite (Irish Hill Brand) is in increasingly strong demand, bringing full prices. Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: Arrivals this week are somewhat below the average. The demand, however, is strong, and prices remain very firm, especially for G.G.B. "Angel White" brand, 95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate) more inquiry; selected crystal lump is scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; and selected crystal ground, £8. Sulphate firm, and prices are better; best lump, 35s. 6d.; good medium, 30s.; medium,

25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.G.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumice-stone somewhat quieter; ground at £10., and specially selected lump, finest quality, £13. Iron ore easier. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 10s. to 12s. 6d. Purple ore quiet. Spanish manganiferous ore in fair demand. Emerystone: Best qualities sought for at full prices. No. 1 lump is quoted £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal continue in fair demand. Chrome metal, 5s. 6d. per lb. Chrome ore offering more freely, and prices a little easier. Antimony oxide, 24s. to 26s. Asbestos is in strong demand, especially rock; prices firmer. Potter's lead ore continues firm; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Best qualities are scarce—60s. to 80s. Strontia steady; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Bog ore in demand, firm, at 22s. to 25s. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, continues scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel easier. Chrome iron unaltered at last quotations. Ground mica, £50. China clay freely offering—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s (at Runcorn).

TAR AND AMMONIA PRODUCTS.

The benzol market still continues firm, and 3s. 10d. for 90s. and 2s. 10d. for 50 90s. are the ruling prices to-day. There is a fair demand for crude naphtha, and full prices are being paid by purchasers. Solvent naphtha is also in request at former prices, while crude carbolic acid is still under a cloud, purchasers offering 1s. 11d., which sellers will not, as a rule, accept. It will surprise no one to learn that the Anthracene Syndicate has broken down, mainly because Beckton refuse to join the ring, and though 1s. 3d. to 1s. 4½d. is spoken of as being to-day's price, it is probable it could be purchased a little under this lowest price. Pitch is very quiet, and it is probable that when business is resumed lower prices will be ruling.

The sulphate of ammonia market, though quiet, is steady, and it is satisfactory to note that £11. 7s. 6d. is being paid at Hull, and £11. 7s. 6d. to £11. 10s. at Leith for spot parcels. Beckton nominal price is £11. 12s 6d., while outside London makes are going for £11. 7s. 6d. There is no secret in the fact that several dealers have oversold themselves for this month's delivery, and are anxious to secure as much as possible in order to save themselves. There have been considerable shipments to New York and Philadelphia, and it is stated that such orders are likely to continue, especially during the summer months, as the ammonia is not required for agricultural purposes, but has connection with the use of ammonia refrigerating machines, now largely employed in the States.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There has been considerable animation in the chemical market this week, especially for bleaching powder, which has risen rapidly in price, owing to the favourable aspect of the negotiations for the formation of a Chemical Union or Syndicate. Buyers are anxious to come for forward deliveries, but it has been agreed, pending syndicate negotiations, that makers will not sell beyond end of September. Caustic soda unaltered in price, but market firm. Soda ash and soda crystals slightly better.

Quotations are as follows:—Bleaching powder, in softwood casks, £5. 5s. per ton, prompt delivery; £5. 10s. per ton August-September; caustic soda, 77%, £10. per ton; ground and packed in 3-4 cwt. barrels, £13. per ton; soda ash, 48/52%, 1¼d. per degree, less 5%; soda crystals, £2 11s per ton, in casks, gross weight; £2. 11s. per ton, in 2 cwt. bags, net weight; and £2. 13s 6d. per ton, in 1 cwt. bags, net weight; sulphate of soda, in bulk, 32s. per ton; ground and packed in casks, 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 4⅛d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £5. 15s. per ton; in 5-7 cwt. casks. £5. 5s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

The market for small coals for manufacturing purposes is again easier, and prices range from 5s. 6d. to 6s. 6d. per ton.

The application of the Northumberland miners for an advance of wages, made early in June, was considered at a meeting of coalowners and representatives of the miners on Saturday last, and it was decided to grant an advance of two and a half per cent., to take effect from the following Monday.

The following are the exports of chemicals from the Tyne for the half-year ending June 30th and corresponding period of last year.

	June 1889. tons.		June 1890. tons.
Alkali & Soda Ash	6,594		7,357
Bicarbonate of Soda	47		43
Bleaching Powder	9,884		13,761
Manure	3,215		6,665
Soda Crystals	9,455		8,524
Sulphate of Soda	268		1,297
Caustic Soda	(no separate return)		4,813
Other Chemicals	12,529		5,181
	41,992		47,641

THE METAL MARKETS.

LONDON.

WEDNESDAY.—At the Metal Exchange, copper was firm, Chili bars G.O.B.'s and G.M.B.'s closing at £57. 5s. to £57. 12s. 6d. cash, and £58. to £58. 7s. 6d., three months. Tin has advanced 12s. 6d., Straits closing at £93. 15s. to £94. 5s., cash, and £94. 7s. 6d. to £94. 17s. 6d., three months; Australian, £94., cash; English ingots, £97. to £97. 10s. Spelter dearer; £23. 10s. paid, and still buyers. Spanish lead, £13 2s. 6d.; English, £13. 5s. to £13. 7s. 6d. Scotch pig iron, 45s., cash; Cleveland, 43s. 3d. Rothschild's quicksilver, £10. 10s.; second-hand, £10. 1s. 6d. to £10. 2s. 6d. In copper shares, Rio Tinto and Mason and Barry fell ⅜ each to 22⅛ and 7¼ respectively.

GLASGOW.

WEDNESDAY.—Market quiet. Cleveland cash iron scarce. Scotch done at 45s. 3d., 44s. 11d., and 45s., cash, also at 45s. 5½d., 45s. 6d, and 45s 1½d., one month; closing buyers at 44s. 11d., cash, sellers ask ½d. more. Middlesbrough done at 43s. 9d. to 43s. 7½d., cash; closing buyers at 43s. 3d., cash, sellers ask 43s. 6d. Hematite closes with buyers at 51s., cash, and 51s. 2d., one month; sellers ask 51s. 1½d., cash.

WOLVERHAMPTON.

WEDNESDAY.—The quarterly meeting was held here to-day. There was a steady confident tone in both crude and finished iron. Marked bars in fair sale at £8. 10s.; sheets better at £7. 17s. 6d. for singles. Hoops and tube strip in fair demand at £7. 10s.; gas tube strip in good call at £7. 2s. 6d.; galvanised sheets improved at £12. for doubles in bundles. Tredegar hematite pigs were quoted firm at 67s. 6d., delivered; Staffordshire native cinder 40s.; Derbyshire 46s.

IMPORTS OF CHEMICAL PRODUCTS

AT

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending June 28th.

Arsenic—

Germany,	£115.	Burgoyne Bubridge & Co.

Acetate of Lime—

U. S.,	358 pks.	Lister & Biggs

Acetic Acid—

Holland,	15 pks.	A. & M. Zimmerman

Alkali—

Holland,	380 c.	E. Olyett & Sons
,,	60	Beresford & Co.
France,	101	P. Hecker & Co.

Alum—

Holland,	61 pks.	Ohlenschlager Bro.

Antimony Ore—

France,	10 t.	Pillow Jones & Co.
,,	20	H. R. Merton & Co.
Smyrna,	5	French & Smith
Halifax,	8½	H. Bath & Son
France,	52	Major & Field
Spain,	40	J. J. Pratt & Sons
,,	20	H. Emanuel
France,	25	,, ,,

Barytes—

Holland.	32 cks.	W. Harrison & Co.
,,	40	Magee, Taylor & Co.
Belgium,	11	Leach & Co.
Germany,	18	L. & I. D. Jt. Co.

Bones—

France,	5 t.	C. A. & H. Nicols
Gibraltar,	29	Goad, Rigg & Co.
Sydney,	7	
,,	5	Coml. "Bkg." Co. "of Sydney

Boracic Acid—
Italy, 20 pks. W. Nicolson & Co.
Brimstone—
Italy, 400 t. Brandram Bros. & Co.
,, 50 J. Kitchin, Ltd.
,, 25 Chilworth Gunpowder Co.
,, 5 Houghton & Co.
Cream of Tartar—
Spain, 5 pks. J. Knill & Co.
,, 6 F. Smith
France, 5 W. C. Bacon & Co.
,, 5 Ross & Deering
,, 10 W. C Bacon & Co.
Spain, 10 C. Christopherson & Co.
France, 2 B. & F. Wf. Co. Ltd.
,, 2 Hyslop & Symonds
Caoutchouc—
E. Indies 20 c. Matheson & Co.
Singapore, 60 Aschenheim & Fuhrken
France, 44 Kebbel Son & Co.
Germany, 67 ,,
Portugal, 17 L. & I. D. Jt. Co.
Zanzibar, 43 A. Frey & Co. Ltd.
France, 80 Stiebel Bros.
Caustic Potash—
France, 9 drs. J. A. Reid
,, 20 pks. Fuerst Bros.
Carbolic Acid—
Holland, 112 pks. J. G. Fisher
Copper Ore—
Adelaide, 11 c. Harold Bros.
Cobalt Ore—
France, 253 t. Newcomb & Son
Chemicals *(otherwise undescribed)*
Germany, £16 L. & I. D. Jt. Co.
,, 80 A. & M. Zimmermann
Holland, 30 ,, ,,
,, 15 Phillipps & Graves
Germany, 35 Craven & Co
,, 150 G. Steinhoff
,, 49 Phillipps & Graves
,, 12 T. H. Lee
,, 135 A. & M. Zimmermann
Holland, 20 Phillips & Graves
France, 12 H. Lorenz
Italy, 245 L. & I. D. Jt. Co.
Germany, 65 B. & N. Wvs. Co. Ltd.
,, 7 L. & I. D. Jt. Co.
,, 690 A. & M. Zimmermann
Dyestuffs—
Turmeric
Cochin, 215 pks. Newcomb & Son
Myrabolams
E. Indies, 500 pks. Wrightson & Son
,, 800 L. & I. D. Jt. Co.
Saffron
Spain, 1 pk. B. & N. Wvs. Co. Ltd.
,, 1 C. Brumlen
,, 1 Major & Field,
Sumac
Italy, 700 pks. J. Kitchen, Ltd.
Gambier
Singapore, 169 pks. P. & S. Evans & Co.
,, 429 W. H. Cole & Co.
,, 16 Brinkmann & Co.
,, 421 Cox Paterson & Co.
,, 209 ,, ,,
,, 425 L. & I. D. Jt. Co.
Cochineal
Canaries, 25 pks. W. H. Cole & Co.
,, 20 ,, ,,
,, 11 Kuhner, Henderson & Co.
,, 6 Swanston & Co.
,, 11 H. R. Toby & Co.
Valonia
Smyrna, 311 t. J. Graves
,, 100 A. & W. Nesbitt
Tanners' Bark
Holland, 40 t. J. J. Williamson & Son
,, 48 S. Barrow & Bro.
U. S., 10 W. A. Bowditch
Durban, 17 A. & W. Nesbitt
Cape, 8 Anning & Cobb
Melbourne, 10 ,, ,,
Holland, 50 Hicks, Nash & Co.
Adelaide, 40 Baxter & Hoare
,, 50 Goad, Rigg & Co.
Melbourne, 191 Beresford & Co.
,, 149 Baxter & Hoare
U. S. 64 G. B. Mackerith
Adelaide, 11 Devitt & Hett
Indigo
Germany, 14 chts. F. W. Heilgers
E. Indies, 35 L. & I. D. Jt. Co.
,, 17 Parsons & Keith
,, 13 ,, ,,
,, 17 L. & I. D. Jt. Co.
,, 6 ,, ,,
Orchella
Portugal, 64 pks. N. Smith
,, 143 L. & I. D. Jt. Co.
Extracts
France, 50 pks. Prop. Chmbln's. Wf.
Halifax, 600 A. J. Humphrey
,, 269 T. Ronaldson & Co.
France, 42 Prop. Chmbln's Wf.
,, 80 L. J. Levinstein & Sons
Holland, 160 T. H. Lee
France, 70 L. J. Levinstein & Sons
Holland, 4 Nugent Brs
Denmark, 1 R. J. Fullwood & Bland
Logwood
France, 180 t. A. Hagan
Argols
Italy, 437 B. Jacob & Sons
,, 183 Thames S. Tug Co.
France, 42 pks. N. S. S. Co., Ltd.
Cape, 6 Hale & Son
Fustic
France, 180 t. A. Hagan
Alizarine
Holland, 52 pks. J. Forsey
Dyestuffs *(otherwise undescribed)*
Denmark, 3 pks. Bailey & Leetham
Guano—
France, 30 t. Weatherley Mead & Co.
Gutta Percha—
Germany, 86 c. Soundy & Son
Singapore 2 Kleinwort Sons & Co.
,, 653 H. W. Jewesbury & Co.
Glucose—
Germany, 25 pks. 220 cwts. L. & I. D. Jt Co
,, 10 80 J. Knill & Co.
France, 100 100 Seaward Bros.
,, 100 100 Barrett Tagant & Co.
U. S. 50 280 L. Sutro & Co.
,, 800 800 A. Dawson
,, 500 500 T. C. Howell
,, 87 435 T. M. Duche & Sons
Germany, 100 100 M. D. Co.
U. S., 74 395 T. M. Duche & Co.
,, 40 220 Horne & Co.
,, 120 740 R. G. Hall & Co.
,, 400 400 Barrett, Tagant & Co.
Germany, 67 300 L. Sutro & Co.
,, 25 180 Pillow, Jones & Co.
,, 25 197 Proprs. Chmbln's Wf.
U. S., 500 500 Barrett, Tagant & Co.
,, 25 150 L. & I. D. Jt. Co.
Germany, 600 600 J. Barber & Co.
,, 400 400 M. H. Voss
,, 150 220 H. A. Litchfield & Co.
,, 40 320 T. M. Duche & Son
,, 76 445 J. Knill & Co.
,, 50 252 Baxter & Hoare
,, 50 460 J. H. Epstein
,, 200 200 J. F. Ohlmann
France, 100 100 Seaward Bros.
,, 300 300 De Paiva, Norman & Co.
Glycerine—
Germany, £110 Beresford & Co.
,, 34 H. Lambert
Holland, 150 F. W. Hielgers & Co.
Germany, 45 Beresford & Co.
Manure—
Holland, 208 t. Anglo-Contntl. G. Works
France, 145 ,, ,,
Germany, 8 Perkins & Homer
Holland, 240 Anglo-Contntl. G. Works
,, 170 Lawes Manure Co., Ltd.
France, 5 Weatherley, Mead & Co.
,, 180 T. Farmer & Co.
,, 29 Co-op. Lighterage Assn. Ltd.
Phosphate Rock
Montreal, 150 t. A. Hunter & Co.
U.S., 1,600 Fox, Roy & Co.
,, 1,200 Wyllie & Gordon
,, 58 ,, ,,
Naphtha—
Holland, 15 cks. Lister & Biggs
,, 12 drs. Domeier & Co.
Nitre—
France, 41 bgs. Co-op. Lighterage Asstn. Ltd.
Pyrites—
La Laja, 250 t. Forbes, Abbott & Co.
Spain, 950 G. Ward & Sons
,, 1,931 C. Tennant, Sons & Co.
Potassium Oxalate—
Norway, 10 pks. A. Hughes
Pitch—
Germany, 140 brls. Watts & Co.
N. Russia, 150 Sieveking & Co.
Potassium Bromide—
Germany £50 L. & I. D. Jt. Co.
Permanganate—
France, £36 Spies Bros. & Co.
Potassium Sulphate—
Germany, 57 pks. Petri Bros.
,, 11 Beresford & Co.
France, 18 Weatherley, Mead & Co.
Potashes—
Montreal, 92 c. Charles & Fox
Paraffin Wax—
U.S., 411 pks. H. Hill & Sons
,, 100 J. Lucey & Sons
,, 3,072 brls. J. H. Usmar & Co.
,, 100 E. & H. Holdsworth
Potassium Carbonate—
France, 7 pks. J. A. Reid
Holland, 18 Spies Bros. & Co.
France, 36 J. Cripps
Pearl Ashes—
Montreal, 32 c. Charles & Fox
France, 205 F. W. Berk & Co.
Sodium Acetate—
France, 19 pks. A. Lumbeck & Co.
Sodium Hyposulphite—
Germany, £45 Beresford & Co.
Stearine—
France, 106 bgs. H. Hill & Sons
Sweden, 3 cks. C Lamb & Co.
U.S., 20 hds. Beresford & Co.
Holland, 4 cks. 10 cs. Perkins & Homer
Saltpetre—
E. Indies, 1,229 bgs. Ralli Bros.
,, 1,320 Clift, Nicholson & Co.
Germany, 118 cks. P. Hecker & Co.
,, 100 T. Merry & Son
,, 72 bgs. J. Hall & Bons
Sodium Sulphate—
Germany, 181 pks. Petri Bros.
Sodium Phosphate—
Holland, 10 cks. Middleton & Co.
Tar—
N. Russia, 799 brls. Sieveking, Droop & Co.
France, 400 Burt, Boulton & Co.
Tartaric Acid—
France, 20 pks. B. & F. Wf. Co. Ltd.
Holland, 20 ,, ,,
,, 4 F. W. Heilgers & Co.
,, 12 B. & F. Wf. Co. Ltd.
Tartar—
France, £160 L. & I. D. Jt. Co.
Ultramarine—
Holland, 1 cs. Glaeser & Co.
,, 6 Phillipps & Graves
,, 1 ck. ,, ,,
,, 38 pks. Seaward Bros.
,, 7 Ohlenschlager Brcs.
Zinc Oxide—
Germany, 50 brls. M. Ashby, Ltd.
Holland, 300 ,, ,,
,, 75 cks. Prprs. Dowgate Dk.
U.S., 200 brls. M. Ashby Ltd.,
Holland, 37 Beresford & Co.
Germany, 50 M. Ashby. Ltd.
Holland, 80

LIVERPOOL.

Week ending July 1st.

Alum—
Rotterdam, 41 cks.
Barytes—
Antwerp, 46 cks. 400 bgs.
Bones—
New York, 174 bgs.
Karachi, 2,668
Chemicals *(otherwise undescribed)*
Rotterdam, 17 cks.
Rouen, 14 Co-op. Wholesale Scty. Stores
Charcoal—
Rouen, 168 bgs. Co-op. W'sale Scty. Stores
Copper Sulphate—
Hamburg, 16 cks.
Copper Precipitate—
Huelva, 525 t. Manchester Ship Canal
Copper Ore—
Lisbon, 11 bals. Lewis, Lazarus & Co.
Caoutchouc—
New York, 4 cs Torilhorn & Co.
C. C. Castle, 8 brls. 1 cs.
,, 2 L. Hart & Co.
,, 1 B.C. Nordlinger
,, 4 C. L. Clare & Co.
,, 2 W. D. Woodin & Co.
,, 1 Davies Robbins & Co.
,, 2 J. Smith
,, 2 W. B. McIver & Co.
,, 1 1 cs. Hobson & Co.
Axim, 2 F. & A. Swanzy
Sierra Leone, 25 brls. Cie Francaise
,, 18
,, 25 Pickering & Berthoud
New York, 3 brls. J. Kenyon & Sons
Pernambuco, 23 Fry, Meiers, & Co.
,, 11
Lisbon, 13 2 cs. H. Diaper & Co.
Mussera, 5 bgs. Samson & de Liagre
Ambrizette, 25 Samson & de Liagre
,, 2 cks. 13 J. Holt & Co
,, 11 Taylor, Laughland & Co.
Mucilla, 5 ,,
,, 101 Samson & de Liagre
Black Point, 4 Pinto Leite, & Nephew
Loango, 2 ,,
,, 2 pns. Edwards Bros.
N'gore, 10 R. W. Roughton
Cape Lopez, 30 cks. J. Holt & Co.
Gaboon, 6 ,,
,, 6 Daumas & Co.
,, 14 A. V. Heyder
Elobey, 9 J. Holt & Co.
,, 23 Hatton & Cookson
Cameroons, 4 Rider, Son & Co.
,, 1 pn. 3 hds. Lucas Bros. & Co.
,, 9 cks. R. & W. King
Old Calabar, 1 African Association
Accra, 2 brls. Hutton & Co.
,, 9 pns. J. J Fischer & Co.
Salt Pond, 1 brl. D. Jones & Co.
Grand Bassam, 10 bgs. J. Stradleman
,, 3 L. Hart & Co
,, 1 8 Oppenheimer Bros.
,, 2 Pickering & Berthoud
,, 1 F. Schaeffer & Co.
,, 3 bgs. E. Wayland
,, 1 Un. Cmcl. Branch
,, 1 8 W. D. Woodin
,, 1 T. E. Tomlinson
,, 1 A. Millerson & Co.
,, 1 S.C. Nordlinger
,, 6 71 2 cs.
,, 1 Millward, Bradbury & Co.
,, 2 18 cs. A. Verdier
,, 10 F & A. Swanzy
,, 7 bgs. 1 cs Edwards Bros.
,, 2 A. Reis
,, 4 Litchfield & Co.
,, 1 brl. H. S. Attia & Bros.
Bathurst, 24 cks. A. Reis
,, 2 pns. 10 1 cs. A. Cros & Co.
Dyestuffs—
Divi Divi
Hamburg, 57 bgs.
Argols
Bordeaux, 9 cks.
Alizarine
Rotterdam, 6 cks.
Indigo
Lagos, 2 cks. Edwards Bros.
Fustic
Pernambuco, 1,860 kilos.
Orchella
Lisbon, 82 bls. A. Barbosa & Co.
,, 64
Las Palmas, 6 J. F. Henning
Cochineal
Grand Canary, 6 bgs. Bruce & White
Las Palmas, 20 bgs. Swanston & Co.
,, 106 Beach & Co.

Sumac
Barcelona, 100 bgs. A. Ruffer & Sons
Myrabolams
Bombay, 2,013 bgs. D. Sassoon & Co.
,, 650 Beyts, Craig & Co.

Glycerine—
Hamburg, 20 cs. 1 dm. 7 crbys.
Rouen, 5 14 Co-op. W'sale. Scty. Stores

Glucose—
Hamburg, 52 cks.
New York, 65 brls.
Hamburg, 139 cks.
Philadelphia, 120 brls.

Horn Piths—
Monte Video, 85 t. Haycroft & Pethick
Paysandu, 4,300 Hugo Brown

Manganese—
Hamburg, 8 cks.

Manganese Ore—
Villa Nova de Mil Fontes, 580 t. Macqueen Bros.

Potassium Prussiate —
Rotterdam, 4 cks.

Phosphate—
Montreal, 200 t.

Potash—
Montreal, 25 brls. Wilson, Patterson & Co.
Rouen, 17 cks. Co-op. W'sale. Scty. Stores

Pitch—
Rouen, 24 cs. Co-op. W'sale. Scty. Stores

Pyrites—
Huelva, 1,380 t.
,, 1,430 Matheson & Co.
,, 1,563 ,,

Sulphur Ore—
Huelva, 1,651 t. Matheson & Co.
,, 1,446 ,,

Saltpetre—
Antwerp, 135 bgs. J. T. Fletcher & Co.
Hamburg, 120

Stearine—
Baltimore, 49 hds.

Tartar—
Bordeaux, 7 cks.
,, 4

Tartar Salts—
Rotterdam. 20 cks.

Tartaric Acid—
Rotterdam. 20 cks.

Ultramarine—
Rotterdam, 2 cs. 29 cks.

Verdigris—
Bordeaux, 4 cks.

Zinc Oxide —
Antwerp, 107 brls.

HULL.

Week ending July 3rd.

Acids *(otherwise undescribed)*
Hamburg, 15 brls. 2 btls. Wilson Sons & Co.
Rotterdam, 4 cks.

Barytes—
Rotterdam, 33 cks. Hutchinson & Son
Antwerp, 68 Bailey and Leetham
,, 77 H. F. Pudsey
Bremen 2 Tudor & Son
,, 24

Caoutchouc—
Marseilles, 1 cs. Wilson Sons & Co.

Chemicals *(otherwise undescribed)*
Hamburg, 2 cs.
,, 1 Murray & Co.

Dyestuffs —
Madders
Marseilles, 2 cks.
Logwood
Boston, 200 bxs. Wilson Sons & Co.
Sumac
Trieste, 11 bgs. Wilson Sons & Co.
Catania, 20 bls ,,
Palermo, 1,377 pks. ,,
,, 700 bgs. Kuypers Ostler & Scott
Myrabolams
Bombay, 160 bgs.
Rennet
Rotterdam, 6 cks. W. & C. L. Ringrose
Alizarine
Rotterdam, 2 cs. 5 cks. Hutchinson & Son
,, 14 W. & C. L. Ringrose
,, 1 bx. 33 ,,
,, 2 cs. 90 Hutchinson & Son
,, 13 pks. W. & C. L. Ringrose

Glucose—
Hamburg, 10 cks.
New York 37 brls.
Stettin, 10 Wilson Sons & Co.
,, 1,220 bgs. C. M. Lofthouse & Co.
,, 400 ,,
Rotterdam, 50 Hutchinson & Son
Hamburg, 25 cks. Rawson & Robinson
,, 50 Woodhouse & Co.
,, 45
,, 23 Bailey & Leetham
,, 10 cs 200 bgs.

Phosphate—
Ghent, 160 t. Wilson, Sons, & Co.

Sulphur—
Catania, 1,189 pks. Wilson Sons & Co.
,, 50 t.

Soda—
Rotterdam, 20 bgs. C. E. Johnson &Co.

Stearine—
Rotterdam, 40 bgs. Wilson Sons & Co.

Sodium Nitrate—
Hamburg, 194 bgs.

Sulphur Ore—
Seville, 1,265, t.

Tar—
Uleaborg, 600 brls. 300 ½brls. J Good & Sons
,, 1,000 300 J. M. Hamilton & Co.
Marseilles, 33 cks.

Tartaric Acid—
Rotterdam, 4 cks. Hutchinson & Son

Ultramarine—
Bremen, 1 cs. Veltmann & Co.

GOOLE.

Week ending June 18th.

Antimony—
Boulogne, 2 cks.

Acetate of Chrome –
Rotterdam, 16 cks.

Caoutchouc—
Boulogne, 3 cks.
,, 5

Dyestuffs —
Logwood
Lagunade Terminos, 340 t.
Divi Divi
179 t.
Alizarine
Rotterdam, 33 cks.
,, 27
Dyestuffs *(otherwise undescribed)*
Boulogne, 48 cks. 3 cs. 1 bkt.
,, 2 1 49 pks.

Glucose—
Hamburg, 90 bgs.
,, 100
Dunkirk, 100

Phosphate—
Ghent, 800 bgs.

Potash—
Dunkirk, 12 cks.
Calais, 42 drms.

Tartaric Acid—
Rotterdam, 12 cks.

Waste Salt—
Hamburg, 585 cks.
,, 704

GRIMSBY.

Week ending June 23rd.

Albumen—
Hamburg, 4 cks.
Antwerp, 7

Chemicals *(otherwise undescribed)*
Hamburg, 2 pks.
,, 17

Dyestuffs *(otherwise undescribed)*
Antwerp, 1 cs.

Glucose—
Hamburg, 12 cks. 20 pks.

TYNE.

Week ending July 2nd.

Alum Cake—
Hamburg, 18 cks. Tyne S S. Co.

Barytes—
Rotterdam, 46 cks. Tyne S.S. Co.

Copper Regulus—
Huelva, 233 t. H. Scholefield & Son

Copper Precipitate—
Huelva, 913 bgs. 2 cks. H. Scholefield & Son
,, 1,762
,, 2,140

Phosphate—
Antwerp, 240 t. Langdale's Chem. Co.

Sodium Silicate—
Rotterdam, 4 cks. Tyne S.S. Co.

Sulphur Ore—
Pomaron, 1,200 t. Mason & Barry

Salt Cake—
Harburg, 143 t.

Saltpetre—
Hamburg, 5 cks. Tyne S.S. Co.
,, 12 ,,

Superphosphate—
Antwerp, 250 t. Langdale's Chemical Co.

Zinc Oxide—
Antwerp, 25 brls. Tyne S.S. Co.

GLASGOW.

Week ending July 3rd.

Alum—
Rotterdam, 45 bgs.

Barytes—
Rotterdam, 48 cks.

Cobalt Ore—
Antwerp, 42 t.

Chemicals *(otherwise undescribed)*
Hamburg, 1 cs.

Dyestuffs—
Sumac
Leghorn, 800 bgs. 25 bls.
Alizarine
146 cks.
Rotterdam, 133
Madders
Marseilles, 10 brls. J. Pattison & Co.
Valonia
Marseilles, 220 brls.
Fustic
Jamaica, 2 t. 1 c. Wallace, Wilkie & Co.
,, 57
Extracts
Dundalk, 2 cks. 1 cs. Henderson, Hogg & Co.
Rotterdam, 5 pks.
Dyestuffs *(otherwise undescribed)*
Boston, 100 bxs. J. Dawson & Co.

Glucose—
Stettin, 75 cks.
Amsterdam, 5

Potash—
Rotterdam, 11 cks.

Paraffin Wax—
New York, 275 brls. H. Hill & Son
,, 990

Sulphur—
Leghorn, 540 bgs.

Sulphur Ore—
Bergen, 220 t.

Tartar—
Oporto, 8 cks.

Tartaric Acid—
Marseilles. 9 brls.
,, 12 cks.

Waste Salt—
Hamburg, 508 bgs.

Zinc Oxide—
Antwerp, 20 brls.

EXPORTS OF CHEMICAL PRODUCTS

OF

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending June 25th.

Arsenic—
Boston, 132 cks. £292
Wellington, 2 t. 31
,, 1 15

Ammonium Sulphate—
Hamburg, 40 t. £450
Rotterdam, 50 19 c. 61
Malaga, 301 16 3,600
Hamburg, 20 217
Berbice, 10 121
Constantinople, 7 19

Alum Cake—
Calcutta, 23 t. 6 c. £95

Acids *(otherwise undescribed)—*
New York, 25 cs. £70

Ammonium Carbonate—
Bremen, 20 cks. £142

Acetic Acid—
Lisbon, 1 t. 4 c. £8
Wellington, 20 gs. 35

Ammonia—
Cadiz, 1 t. £50

Boracic Acid—
Adelaide, 10 c. £15
Melbourne, 1 t. 7 54

Borax—
Melbourne, 80 cks. £118

Collodian—
Shanghai, 5 cs. £78

Caustic Soda—
E. London, 10 c £20
Oporto, 5 t. 54
Brisbane, 6 1 61
Hawke'sBay, 10 83
Lisbon, 4 16 50
Melbourne, 3 14 40
E. London, 9 13
,, 18 56

Condy's Fluid—
Melbourne, 1 t. 2 c. £74

Creosote Salts—
Antwerp, 121 t. 11 c. £244

Cream of Tartar—
Adelaide, 5 c. £27
Melbourne, 1 t. 101
,, 2 202
,, 1 105

Cream of Tartar—*continued.*
Wellington, 4 c. 22
Auckland, 2 11
Newcastle, 5 34
Wellington, 1 100

Copper Sulphate—
Sydney, 5 t. £120
Constantinople, 1 10 c. 44
Treport, 7 170
Rouen, 8 192
Sydney, 5 120
Bordeaux, 10 220
,, 20 440

Citric Acid—
Adelaide, 1 c. £7
Sydney, 5 32
Rotterdam, 1 7
Madras, ½ 2
Melbourne, 5 34

Citric Acid—*continued.*

Rotterdam,	1 t.	5 c.	175
Lisbon,		3	20
Hamburg,		10	68
St. Petersburg,	10 cks.		380
Bremen,		5	36
St. Petersburg,	1 t.	10	200
Copenhagen,	1 ck.		34
Hamburg,	3 kgs.		21
Libau,	1 t.		149
Hamburg,		2	15
Sydney,		2	13

Carbolic Acid—

Wellington,		6 cs.	£23
Hong Hong,	1 t.	6 c.	12
Cape Town,		1 cs.	18
Algoa Bay,		9	42
Treport,	2	13	97
Stettin,	894 gls.		192
Baltimore,	12 cs.		53
Yokohama,	2,000 lbs.		127
New Orleans,	2 cs.		17
Penang,	1 t.	17 c.	20

Carbon Bisulphide—

New Orleans,	2 t.		£34

Chemicals *(otherwise undescribed)*

Sydney,	14 cs.	20 kgs.	£276
Bombay,	24		274
Melbourne,	50 cks.		325
Brisbane,	10 cs.		66
Hong Kong,	9 cks.		35
Yokohama.	32 cs.		311
Adelaide,	25		199
Sydney,	12		160
Yokohama,	40		192

Disinfectants—

Melbourne,	165 cs.		£155
,,	50 drs.		31
Hong Kong,	250 gls.		40
Hamburg,	5 t.	6 c.	63
Sydney,	38 cs.		97
Natal,	10 pks.		25

Guano—

Guadeloupe,	286 t.		£2,860

Hydro Carbon—

Rotterdam,	21 pks.		£71

Manure—

Barbadoes,	25 t.		£250
Malaga,	50		400
Valencia,	216	15 c.	1,736
Hamburg,	150		1,875
Bombay,		10	2
Havre.	50		600
Gothenburg,	100		505
Antigua,	70		430
Riga,	200		651
Guadeloupe,	20		200
Barbadoes,	10		115
Tarragona,	7	4	60
Valencia,	330	2	2,765
Brisbane,	10		100
Bombay,	10	14	60

Oxalic Acid—

New York,	2 t.	10 c.	£90

Phosphorus—

Hong Kong,		3 c.	£34
Wellington,		5 cs.	35

Potassium Bichromate—

Salonica,	1 t.	1 c.	£40

Potash Crystals—

New York,	4 pks.		£20

Potassium Chlorate—

Lisbon,	6 brls.		£14

Sodium Tartrate—

Brussels,	1 ck.		£22

Sheep Dip—

E. London,		10 c.	£28
,,		75 cs.	210
Natal,		30	102

Sulphuric Acid—

Natal,		25 cs.	£25
Bingapore,		18 c.	16

Saltpetre—

Gibraltar,	5 t.		£115
Adelaide.	1	5 c.	27
Melbourne,	2	10	55
Rio Janeiro,	5	7	120
Hamburg,	1		21
Lisbon,	3 brls.	200 bgs.	313
Ghent,	1 t.	19 c.	43
Wellington,		10	12
Brisbane,	3	18	81

Salammoniac—

Salonica,	1 t.	19 c.	£64
Varna.		14	23

Sulphur—

Melbourne,	5 drms.		£20
Algoa Bay,	100 kegs.		54
B. Ayres,	50 brls.		39
Newcastle,	5 t.		35

Sodium Bicarbonate—

Newcastle,	40 kgs.		£12

Soda Crystals—

Hong Kong,	16 t.	5 c.	£48

Soda Ash—

Fremantle,	5 t.		£27

Tartaric Acid—

Melbourne,		10 c.	£66
Adelaide,		3	21
Melbourne,	1 t.		131
Adelaide,		5	35
Wellington,		3	22
Auckland,		6	37
Sydney,	23 pks.		38
Newcastle,	1 t.		132
Calcutta,		3	25
Wellington,		9	55

LIVERPOOL.

Week ending June 28th.

Alum Cake—

Calcutta,	11 t.	19 c.	£47

Ammonium Carbonate—

Genoa,		35 c.	£22
Odessa,	13 t.	5	420
Genoa,		10	17
Hamburg,		5 3q.	8
Venice,	1	10 1	50
Barcelona,	1	10	49
Oporto,		11 2	16
Rouen,		15	30

Alum—

Calcutta,	10 t.		£30
Callao,	12	8 c.	65
Ensenada,	5 cks.		5
Batoum,	20 t.	9 1 q.	104
Boston,	2	8	20
Cape Town,	1	1	5
Valparaiso,	1	8	7

Ammonium Sulphate—

Valencia,	49 t.	9 c. 2 q.	£590
Nantes,	80	14	960
Gr. Canary,	2		256
Las Palmas,	37	2	435
Valencia,	116		1,372
Nantes,	10		111

Ammonium Muriate—

Boston,	3	10	£83
Antwerp,	7		9
Philadelphia,	10	2 1	241
New York,	6	10	148

Antimony Regulus—

New York,	10 t.	10 c.	£740

Albumen—

New York,	1 t.		£9

Borax—

Antwerp,	5 t.	3 c. 3 q.	£145
Rouen,	16	2	459
Valparaiso,	4		7
Antwerp,	5	5 3	142
Stockholm,		7	9
Matanzas,		4 3	8
,,		5	7

Bone Waste—

Rouen,	8 t.	11 c.	£65
,,	4	18	26

Bleaching Powder—

Ancona,	66 cks.	13 pps.	
Bordeaux,	489	86 tcs.	
Calcutta,		102 cs.	
Genoa,	222	29 pks.	
Ghent,	158		
Hamburg,	25		
Havre,	12		
Montreal,	131		
New York,	42		
,,	77	114 tcs.	
Odessa,	3		
Oporto,		13 brls.	
Rouen,	160		
Bordeaux,	32		
Calcutta,	69 cs.		
Antwerp,	56 cks.		
Baltimore,	90		
Calcutta,		104 cs.	
Genoa,	115		
Leghorn,	7		
Lisbon,	20		
Montreal,	10		
Naples,	21		
Stettin,	12		

Borate of Lime—

Rotterdam,	10 t.	5 c. 2 q.	£123
,,	7	15 3	78

Brimstone—

Colombo,	2 t.	6 c.	£13
Madras,	5	12	43
Rouen,	10	15	81

Copper Sulphate—

Ancona,	5 t.	1 q.	£112
Rouen,	37	1 c.	1,005
Nantes,	44	9	1,075
Bordeaux,	19		230

Copper Sulphate—*continued.*

Genoa,	5 t.	10 c.	1 q.	116
Bordeaux,	50	2		1,073
,,	12	8	1	264
Nantes,	35	7	3	723
Havre,	5			105
Marseilles,	15	3	3	303
Genoa,	25	3		574
,,	2	5	2	45
Nantes,	7	14	3	155
Genoa,	7	17	3	173
Marseilles,	30			690
Nantes,	157	2		3777
Ancona,	4	19	3	105
Bari,	3	1		60
Bilbao,	8	4		180
Bordeaux,	127	12	2	2,924
Genoa,	3	14	2	79
Gothenburg,		19	2	21
Havre,	4	19	3	100
Lisbon,	1			20
,,	2		2	50
Rio Janeiro,	3	19	1	95
Bordeaux,	33	7	2	715
Rouen,	55	6		1,375
Pasages,	5	1	1	95
Calcutta,	10			240
Constantinople,	1	19	2	41

Caustic Potash—

Gothenburg,		7 c.	£7
Montreal,	1 t.	15	35

Caustic Soda—

Hiogo,	100 dms.			
Hong Kong,	15			
Ibrail,	34			
Iquique,		15 cks.		
Leghorn,	10			
Madeira,	10			
Malaga,	58			
Maracaibo,	10			
Matanzas,	16			
Messina,	15			
Montreal,	75	30		
Naples,	29			
New York,	606			
Odessa,	235			
Pasages,	44			
Philadelphia,	254	30		
Rotterdam,	47			
Rouen,	47			
Seville,	8			
Shanghai,	7			
Tarragona,	30 brls.	20 cks.		
Trieste.	44 dms.			
Valencin,	60			
Valparaiso,	100			
Venice,	10			
Vera Cruz,	40			
Yokohama,	100			
Galatz,	114			
Acajutla,	8			
Adelaide,	18			
Amsterdam,	222			
Ancona,	54			
Antonina,	10			
Antwerp,	74			
Barcelona,	70	176 cks.		
Bari,	82			
Batoum,	726			
Bilbao,	57			
Bombay,	47			
Bordeaux,	9			
Boston,	350			
Cartagena,	15			
Ceara,	50			
Charlotte Town,	10			
Corfu,	40			
Fiume,	80			
Galatz,	123			
Hamburg,	10	53 pks.		
Havana,	50			
Havre,	18			
Adelaide,	15			
Alexandria,	20			
Antwerp,	41			
Bahia,	10			
Boston,	200			
Carthagena,	15			
Catania,	70			
Copenhagen,	30			
Corinto,	35			
Galatz,	70			
Genoa,	62			
Haifa,	10			
Hamburg,		47		
Ibrail,	49			
Libau,	15			
Malaga,	6			
Malta,	20			
Monte Video,	200			
Montreal,	10			
Nagasaki,	200			
Naples,	25			
Newfairwater,	30			
New York,	500	5 cs.	50 brls.	
Odessa,	100			
Oporto,	42			

Caustic Soda—*continued.*

Penang,	100 dms.			
Pernambuco,	15			
Philadelphia,	36		135 brls.	
Rangoon,	4			
Rio Janeiro,	20			
Rotterdam,	5			
St. Johns Nfld.,		6 pks.		
Seville,	10			
Stettin,	17			
Valparaiso,	195		45	
Yokohama,	400			

Carbolic Acid—

Hamburg,	4 t.			£411
Rotterdam,		18 c.	2 q.	11
New York,		14		63
Hamburg,	1	4	1	112
Odessa,	2	5	2	73

Copperas—

Alexandria,	13 t.	10 c.		£29
Pirœus,	5	14		11
Beyrout,	2	7		5
Ensenada,	4 cks.			8
Montreal,	9 t.	8 c.	3 q.	21

Citric Acid—

Montreal,		3 c.	£22

Charcoal—

Rouen,	12 t.		£60
Nantes.	100	5 c. 1 q.	1,496
Hamburg,	107	7	550
,,	40	10	200
Rotterdam,	101	13 3	400

Calcium Chloride—

Nantes,	10 t.	10 c.	£19

Carbolic Solid—

Genoa,		5 c. 3 q.	£33
Pirœus,		2 2	15
New York.	2 t.	5	50

Cobalt Oxide—

New York,		4 c. 2 q.	£203
Gijon,		2	90

Chemicals *(otherwise undescribed)*

Vera Cruz,		7 c.	1 q.	£29
Baltimore,	14 t.	12		68
New York,		11		60

Disinfectants—

Rouen,	1 t.	5 c.		£8
Hamburg,	5	5	2	645

Epsom Salts—

Messina,	15 brls.		
Calcutta,	250 kgs.		
Rio Janeiro,	50		

Ground Spar—

Hamburg,	25 t.	8 c.	£300
Havre,	50	4	436

Guano—

Malaga,	9 t.	19 c.	1 q.	£97

Gypsum—

New York,	4 t.	11 c.		£20

Horn Waste—

Hamburg,	15 t.	18 c.		£90
,,	19	7		120

Iron Oxide—

Philadelphia,	23 t.	12 c.		£490

Iodine—

Hamburg,	5 t.		£3,000

Magnesia—

Vera Cruz,	1 cs.		

Manure—

Santos,	1 t.	1 c.	1 q.	£11
St Nazaire,	147	18	1	597

Magnesium Calcide—

Havana,	144 lbs.		£162

Oxalic Acid—

Barcelona,	10 t.	10 c.	1 q.	£298
Antwerp,	1			33
New York,	4	5		175
,,	5			62

Potassium Carbonate—

Gothenburg,		7 c.	£6

Potassium Bichromate—

Barcelona,	4 t.	17 c.		£174
,,	4	10	1 q.	152
Smyrna,	1		1	45
Syra,		6	3	25
Genoa,		10		20
Kobe,	3	12		130
Genoa,	2	10		220
Bari,	1	2	2	42

Phosphorus—

Vera Cruz,		4 c.		£53
,,	1 t.	13		265

Pitch—

Bilbao,	20 t.		

Phosphate—

Hamburg,	18 t.	10 c.	£56

Potassium Chlorate—

Lisbon,		5 c.	£12
Odessa,		3	7
Vera Cruz,	1 t.		44

Potassium Chlorate—*continued.*

Copenhagen,	3	10	159
E. London,		5	7
Oporto,	1		42
Gothenburg,	14	10	613
Hamburg,	5		225
Lisbon,		19	42
Sydney,	5		210
Messina,		10	21
Naples,	2	10	125
Santander,		10	23
Brindisi,		10	25
New York,	15		600

Potassium Prussiate—

Gothenburg,	12 c.	£50

Phosphate of Lime—

Philadelphia,	10 c.	£130

Potassium Sulphate—

Las Palmas,	4 t.	£43

Picric Acid—

New York,	2 t.	£260

Sodium Bichromate—

Barcelona,		10 c.	1 q.	£13
Havre,	5 t.	10		155

Salammoniac—

Naples,	1 t.	4 c.	2 q.	£38
Alexandria,	2	10		92
Genoa,	4 c.	3 q.		8
Alexandria,	1			35
Kustindje,		2	3	5
Philadelphia,	4	2	1	144
Calcutta,	4	1		135
Leghorn,		13		23
Genoa,	1	4		41
Naples,	1	2	1	41

Sodium Bicarbonate—

Ancona,	32 cks.	
Bremen,		8 brls.
Calcutta,	250 kgs.	
Candia,	20	
Genoa,	40	
Hamburg,	220	
London, Ont.,	100 kgs.	
Melbourne,	100 kgs.	20 cks.
Montreal,	300	2
,,	575	22
Quebec,	25	
Rouen,	130	
St. John, N.B.,		25 dms.
Toronto,	400 kgs	
Alexandria,		60 brls.
Bombay,	250	
Calcutta,		2 cs.
Guantanamo,		1 brl.
Hamburg,		4 cks.
Patras,	20	
Piræus,		30
Stettin,	122	

Soda Crystals—

Boston,	212 cks.	280 brls.
Calcutta,	30	
Callao,	100	
Charlotte Town,	25	
Philadelphia,		374 kgs.
Smyrna,		10 bgs.
Valparaiso,	50	
Boston,	140	500 kgs.
Malta,	50	

Salt—

Antwerp,	125 t.
Barbadoes,	163¼
Batanga,	12½
Boston,	790
Copenhagen,	1,590
Memel,	500
New Orleans,	100
New York,	350
Nieuport,	500
Old Calabar,	150
Opobo,	50¼
Rotterdam,	362
Sandheads,	2,010
Sierra Leone,	15
Stockholm,	48½
Trangesund,	960
Para,	88¾
Quebec,	166½
Archangel,	370
Axim,	5
Boston,	100
Calcutta,	2,320
Cameroons,	40
Chicago,	65
King's Cove,	60
Melbourne,	100
Montreal,	887
Mossel Bay,	44
New York,	327 10 c.
Norrkoping,	30 15
Old Calabar,	120
Quebec,	350
Stockholm,	64 5
Trangesund,	360
Valparaiso,	5
Wyburg,	2,011

Soda Ash—

Baltimore,	208 tcs.	197 cks.	
Barcelona,		20	
Boston,	28	142	
Calcutta,		2	
Madeira,	2		
Melbourne,		174	
New York,		290	
Philadelphia,		109	
Rio Janeiro,	90 brls.		
Rithymo,	100		
Sherbrooke,	16 tcs.		
Smyrna,	50 brls.		
Syra,	100		
Vera Cruz,	50		
Valparaiso,	50		
Baltimore,	171 tcs.	270	
Carthagena,		30	
Lisbon,		21	
Monte Video,	100 brls.		
Montreal,		14	
New York,		91	
Philadelphia,		91	
Rio Janeiro,	230		
Santos,	5		

Sodium Silicate—

Genoa,	135 brls.	

Sodium Nitrate—

Las Palmas,	1 t.	3 c.		£9
Seville,	25			204
Ancona,	6	7		50
Almeria,	3	16	2 q.	33
Dunedin,	6	1	2	50

Sulphur—

Boston,	19 t.		£75
,,	50	2 c.	225
Rouen,	21	1	95
Calcutta,	45		254

Sheep Wash—

Quebec,	1 t.	3 c.	1 q.	£55

Saltpetre—

Almeria,	1 t.			£19
Las Palmas,	3	2 c.	1 q.	59
Vera Cruz,		10		12
Ceara,		6		8
Monte Video,		7	2 q.	10

Saltcake—

Melbourne,	24 t.	18 c.	£59
Baltimore,	99	15	239
Montreal,	50	13	127

Sodium Biborate—

Hamburg,	1 t.	11 c.	£47
Monte Video,	1	1	32

Sodium Chlorate—

Hamburg,	1 t.		£55
Rotterdam,		3 c.	8
Antwerp,		10	28

Sheep Dip—

B. Ayres,	3 t.		£170
Bahia Blanca,		160 drs.	68

Sodium Sulphate—

Montreal,	2 t.	18 c.	3 q.	£5

Tar—

Monrovia,	4 brls.	
Bahia Blanca,	30	
Sierra Leone,	20	
King's Cove,	15	

Zinc Muriate—

Bombay,	12 c.	£8

Zinc Chlorate—

Bombay,	1 t.	3 c.	1 q.	£16

TYNE.

Week ending July 2nd.

Anthracene—

Rotterdam,	68 cks.

Alum Cake—

Copenhagen,	23 t.	6 c.

Alkali—

Genoa,	8 t.	
Stettin,	5	4 c.
Copenhagen,	3	1
Antwerp,	10	18
Christiania,	10	14
Rotterdam,	5	10
,,	1	11
Barcelona,	13	19
Amsterdam,	18	14
,,	21	3

Antimony—

Rotterdam,	4 t.	

Arsenic—

Barcelona,	3 c.	

Ammonium Carbonate—

Rotterdam,	2 t.	4 c.
Aarhuus,		11

Borax—

Ergasteria,		12 c.

Baryta Nitrate—

Antwerp,	7 c.	

Baryta Carbonate—

Hamburg,	25 t.	

Barytes Carbonate—

Stettin,	100 t.	

Bleaching Powder—

Stettin,	47 t.	10 c.	
Brake,	4		
Copenhagen,	13	6	
Rotterdam,	3	9	
,,	9	10	
Hamburg,	17	6	
,,	76	13	
,,	8	19	
Antwerp,	44	11	
,,	51	18	
,,	19	14	
Christiania,	9	19	
Bilbao,	11	3	
Rotterdam,		14	
,,	9	16	
,,		5	
Aalborg,		6	
Amsterdam,	16	11	
,,	52	14	
Copenhagen,	18	14	
Libau,	35	3	
Genoa,	5	5	
St. Petersburg,	50 t.	3 c.	
,,	79	19	

Caustic Soda—

Stettin,	2 t.	18 c.
Archangel,	4	1
Copenhagen,	4	8
Rotterdam,	100	2
Barcelona,	7	5
,,	58	16
Genoa,	5	16
St. Petersburg	100	11

Glycerine—

Rotterdam,	7 t.	11 c.

Litharge—

Leghorn,	2 t.	5 c.

Magnesia—

Genoa,		19 c.
,,		8
Hamburg,		8
Barcelona,	14 t.	12

Pitch—

Stettin,	104 t.	8 c.

Sodium Bicarbonate—

Brake,	10 c.	

Superphosphate—

Helsingborg,	300 t.	

Soda—

Stavanger,	4 t.	6 c.	
Copenhagen,	78	14	
Rotterdam,	10	13	
Aarhuus,	16	1	
Friederikshavn,		7 t.	10 c.
Esbjerg,	6 t.	9 c.	
Odense,	21	7	
Rotterdam,	8	9	
Randers,	24	3	
Aalborg,	35	14	
,,	24	2	
Amsterdam,	18	8	
,,	5	7	

Sodium Silicate—

Genoa,	11 t.	12 c.

Soda Ash—

Ergasteria,	1 t.	11 c.
Antwerp,	5	8
Aalborg,	3	8
Copenhagen,	10	
Libau,	20	5

Tar—

Archangel,	1 t.	16 c.
Aalborg,		4

GOOLE.

Week ending June 18th.

Alum—

Hamburg,	6 cks.

Benzole—

Dunkirk,	47 cks.
Rotterdam,	25

Coal Products—

Boulogne,	2 cs.	4 cks.
Rotterdam,	56	25 pnchns.

Chemicals *(otherwise undescribed)*

Rotterdam,	1 ck.

Dyestuffs *(otherwise undescribed)*

Hamburg,	31 bgs.

Manure—

Boulogne,	65 bgs.
Hamburg,	456
Dunkirk,	284
Rotterdam,	3

GLASGOW.

Week ending July 3rd.

Ammonium Carbonate—

Valparaiso,	17 c.	£23

Ammonium Sulphate—

Cullera,	50 t.	1 c.	£536
New York,	8	4	81

Borax—

Rotterdam,	1 ck.	£7

Bones—

New York,	16 t.	9 c	£64

Charcoal—

Amsterdam,	33 c.	£7

Epsom Salts—

Christiania,	150 bgs.	£45

Gutta Percha—

Amsterdam,	1 bg.	£10

Potassium Bichromate—

Calcutta,	11¾ c.	£21	
Rotterdam,	64 cks.	512	
,,	5	41	

Potassium Prussiate—

New York,	5 t.	9 c.	£365

Salt—

Valparaiso,	14 t.	3½ c.	£85

HULL.

Week ending July 1st.

Alkali—

Christiania,	50 kgs.	1 ck.
Copenhagen,	30	
Hango,	2 cks.	
Riga,	50 drums	

Bone Size—

Harlingen,	13 cks.
Rotterdam,	5

Caustic Soda—

Amsterdam,	36 drms.
Copenhagen,	10
Dunkirk,	18
Helsingfors,	30
Harlingen,	18
Libau,	54
Wyburg,	180
Gothenburg,	36

Chemicals *(otherwise undescribed)*

Antwerp,	11 cks.	54 pks.	4 cs.
Bremen,	5		
Christiania,	1	7	159 slbs.
Copenhagen,	109		1 cs.
Dunkirk,	30		
Drontheim,	6		
Gothenburg,	1	15	19 cs. 630 slbs.
Helsingfors,	16		
Hamburg,	123	12	117
Harlingen,	3		
Konigsberg,	1		
Libau,	25	100	
New York,	40		
Rotterdam,	31	60	3
Riga,	20	30	
Stettin,	12	30	
St. Petersburg,	67	200	
Wyburg,	2		

Dyestuffs *(otherwise undescribed)*

Antwerp,	3 kgs.	2 cs.
Hamburg,	2 drums	2 cks.
Rotterdam,	2	1
Reval,		52

Manure—

Copenhagen	400 bgs.	
Dunkirk,	306	
Hamburg	752	76 tns.
Reval,		100
Stettin,	374	

Pitch—

Antwerp,	250 t.

Turpentine—

Christiania,	2 cks.

Tar—

Bremen,	150 cks,
Drontheim,	3
Hamburg,	18
Rotterdam,	11

GRIMSBY.

Week ending June 23rd.

Coal Products—

Dieppe,	166 cks.

Chemicals *(otherwise undescribed)*

Antwerp,	49 cks.	
Dieppe,	9	4 cs.
Hamburg,		1
Rotterdam,	11	3

Dyestuffs *(otherwise undescribed)*

Dieppe,	2 cks.

PRICES CURRENT.

WEDNESDAY, July 9, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 °/, and 40 °/	per cwt.	7/- &	12/3
,, Glacial	,,		64/-
Arsenic, S.G., 2000°	,,	0 12	9
Chromic 82 °/	nett per lb.	0 0	6½
Fluoric	,,	0 0	3¾
Muriatic (Tower Salts), 30° Tw.	per bottle	0 0	8
,, (Cylinder), 30° Tw.	,,	0 2	11
Nitric 80° Tw.	per lb.	0 0	2
Nitrous	,,	0 0	1¾
Oxalic	nett ,,	0 0	3¾
Picric	,,	0 1	1
Sulphuric (fuming 50 °/)	per ton	15 10	0
,, (monohydrate)	,,	5 10	0
,, (Pyrites, 168°)	,,	3 2	6
,, (,, 150°)	,,	1 4	6
,, (free from arsenic, 140/145°)	,,	1 7	6
Sulphurous (solution)	,,	2 15	0
Tannic (pure)	per lb.	0 1	1½
Tartaric	,,	0 1	2½
Arsenic, white powdered	per ton	13 5	0
Alum (loose lump)	,,	5 0	0
Alumina Sulphate (pure)	,,	5 0	0
,, ,, (medium qualities)	,,	4 10	0
Aluminium	per lb.	0 15	0
Ammonia, ·880=28°	per lb.	0 0	3
=24°	,,	0 0	1¾
,, Carbonate	nett	0 0	3½
,, Muriate	per ton	22 15	0
,, ,, (sal-ammoniac) 1st & 2nd	per cwt.	37/- &	35/-
,, Nitrate	per ton	40 0	0
,, Phosphate	per lb.	0 0	10½
,, Sulphate (grey), London	per ton	11 10	0
,, ,, (grey), Hull	,,	11 7	6
Aniline Oil (pure)	per lb.	0 0	10½
Aniline Salt ,,	,,	0 0	9
Antimony	per ton	75 0	0
,, (tartar emetic)	per lb.	0 1	1
,, (golden sulphide)	,,	0 0	10
Barium Chloride	per ton	8 7	6
,, Carbonate (native)	,,	3 12	6
,, Sulphate (native levigated)	,,	45/- to	75/-
Bleaching Powder, 35 %	,,	4 15	0
,, Liquor, 7 %	,,	2 10	0
Bisulphide of Carbon	,,	13 0	0
Chromium Acetate (crystal	per lb.	0 0	6
Calcium Chloride	per ton	2 2	6
China Clay (at Runcorn) in bulk	,,	17/6 to	35/-
Coal Tar Dyes:—			
Alizarine (artificial) 20 %	per lb.	0 0	9
Magenta	,,	0 3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London	per unit per cwt.	0 1	5
Benzol, 90 % nominal	per gallon	0 3	10
,, 50/90 ,,	,,	0 2	10
Carbolic Acid (crystallised 35°)	per lb.	0 0	7½
,, (crude 60°)	per gallon	0 2	2
Creosote (ordinary)	,,	0 0	3
,, (filtered for Lucigen light)	,,	0 0	3½
Crude Naphtha 30 % @ 120° C.	,,	0 1	4
Grease Oils, 22° Tw.	per ton	3 0	0
Pitch, f.o.b. Liverpool or Garston	,,	1 8	0
Solvent Naphtha, 90 % at 160°	per gallon	0 1	9
Coke-oven Oils (crude)	,,	0 0	2½
Copper (Chili Bars)	per ton	57 5	0
,, Sulphate	,,	21 0	0
,, Oxide (copper scales)	,,	55 0	0
Glycerine (crude)	,,	30 0	0
,, (distilled S.G. 1250°)	,,	60 0	0
Iodine	nett, per oz.	0 0	9
Iron Sulphate (copperas)	per ton	1 10	0
,, Sulphide (antimony slag)	,,	2 0	0
Lead (sheet) for cash	,,	14 7	6
,, Litharge Flake (ex ship)	,,	15 15	0
,, Acetate (white ,,)	,,	24 0	0
,, ,, (brown ,,)	,,	18 5	0
,, Carbonate (white lead) pure	,,	19 0	0
Nitrate	,,	22 0	0
Lime, Acetate (brown)	,,	7 7	6
,, ,, (grey)	per ton	13 0	0
Magnesium (ribbon and wire)	per oz.	0 2	3
,, Chloride (ex ship)	per ton	2 5	0
,, Carbonate	per cwt.	1 17	6
,, Hydrate	,,	0 10	0
,, Sulphate (Epsom Salts)	per ton	3 0	0
Manganese, Sulphate	,,	17 0	0
,, Borate (1st and 2nd)	per cwt.	60/- &	42/6
,, Ore, 70 %	per ton	4 10	0
Methylated Spirit, 61° O.P.	per gallon	0 2	2
Naphtha (Wood), Solvent	,,	0 3	10
,, ,, Miscible, 60° O.P.	,,	0 4	1½
Oils:—			
Cotton-seed	per ton	22 10	0
Linseed	,,	24 0	0
Lubricating, Scotch, 890°—895°	,,	7 5	0
Petroleum, Russian	per gallon	0 0	5⅛
,, American	,,	0 0	5½
Potassium (metal)	per oz.	0 3	10
,, Bichromate	per lb.	0 0	4¾
,, Carbonate, 90% (ex ship)	per ton	19 10	0
,, Chlorate	per lb.	0 0	4⅜
,, Cyanide, 98%	,,	0 2	0
,, Hydrate (Caustic Potash) 80/85 %	per ton	22 10	0
,, ,, (Caustic Potash) 75/80 %	,,	21 10	0
,, ,, (Caustic Potash) 70/75 %	,,	20 15	0
,, Nitrate (refined)	per cwt.	1 2	6
,, Permanganate	,,	4 2	6
Prussiate Yellow	per lb.	0 0	9½
,, Sulphate, 90 %	per ton	9 10	0
,, Muriate, 80 %	,,	7 15	0
Silver (metal)	per oz.	0 4	0¼
,, Nitrate	,,	0 2	8
Sodium (metal)	per lb.	0 4	0
,, Carb. (refined Soda-ash) 48 %	per ton	6 0	0
,, ,, (Caustic Soda-ash) 48 %	,,	5 0	0
,, ,, (Carb. Soda-ash) 48%	,,	5 2	6
,, ,, (Carb. Soda-ash) 58 %	,,	6 5	0
,, ,, (Soda Crystals)	,,	2 15	0
,, Acetate (ex-ship)	,,	15 15	0
,, Arseniate, 45 %	,,	11 0	0
,, Chlorate	per lb.	0 0	6¼
,, Borate (Borax)	nett, per ton.	29 0	0
,, Bichromate	per lb.	0 0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.)	per ton.	9 15	0
,, ,, (74 % Caustic Soda) ,,	,,	9 10	0
,, ,, (70 % Caustic Soda) ,,	,,	8 17	6
,, ,, (60 % Caustic Soda, white)	,,	7 17	6
,, ,, (60 % Caustic Soda, cream) (f.o.b.)	,,	7 7	6
,, Bicarbonate	,,	5 15	0
,, Hyposulphite	,,	5 10	0
,, Manganate, 25%	,,	9	0
,, Nitrate (95 %) ex-ship Liverpool	per cwt.	0 8	1½
,, Nitrite, 98 %	per ton	28 0	0
,, Phosphate	,,	15 15	0
,, Prussiate	per lb.	0 0	7¾
,, Silicate (glass)	per ton	5 7	6
,, ,, (liquid, 100° Tw.)	,,	3 17	6
,, Stannate, 40 %	per cwt.	2 2	6
,, Sulphate (Salt-cake)	per ton.	1 7	0
,, ,, (Glauber's Salts)	,,	1 10	0
,, Sulphide	,,	7 15	0
,, Sulphite	,,	5 5	0
Strontium Hydrate, 98 %	,,	8 0	0
Sulphocyanide Ammonium, 95 %	per lb.	0 0	8
,, Barium, 95 %	,	0 0	5¼
,, Potassium	,,	0 0	8¼
Sulphur (Flowers)	per ton.	7 10	0
,, (Roll Brimstone)	,,	6 0	0
,, Brimstone: Best Quality	,,	4 2	6
Superphosphate of Lime (26 %)	,,	2 7	6
Tallow	,,	25 10	0
Tin (English Ingots)	,,	97 10	0
,, Crystals	per lb.	0 0	6¾
Zinc (Spelter)	per ton.	23 10	0
,, Chloride (solution, 96° Tw.	,,	6 0	0

THE

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THE CHEMICAL ENGINEER.

TIME was when the Chemical Engineer was a disputed entity; now he is becoming a decided success. We remember, a few years ago, when, in connection with the movement which has culminated in the successful establishment of the Society of Chemical Industry, it was at first proposed to call the then embryo association the "Society of Chemical Engineers." What an amount of criticism was evoked! and from engineers, too, who ought to have known better. The sum and substance of their animadversions, when eliminated from accidents and figures of speech, was a denial of the existence of the, to them, new species of the *genus* engineer. We propose to show that while engineers were claiming that chemists who erected efficient and satisfactory chemical plant were not engineers, and were, in adopting the name of "Chemical Engineers," arrogating to themselves a dignity to which they had no claim, the class to which these captious critics belonged were actually constructing inefficient chemical works, because they, the designers and constructors, were engineers and engineers only.

We have before us the plans and specification for a chemical works built a few years ago by a gentleman, an engineer, as his certificate of M. Inst. C.E., which was displayed on the wall of his office, informed us. The works were for the manufacture of, among other things, sulphuric acid. We have had experience of this plant in actual work, and can truthfully say that it bristled with defects. The chamber levels were such that the acid was made to flow to the wrong end of the series, and the drawing off arrangement was at the nitrous end. The tower saucers were all at levels which made economical working impossible; and the innocence of this engineer had evolved a novel arrangement for concentrating the acid by means of steam, which would have disgraced even the chemistry of a board school boy. The arrangement of the burners in connection with the Glover Tower was about the finest illustration of "how not to do it" that we have ever seen; the gases being taken to the Glover Tower for the sake of their heat, and the burners placed so far away that this heat was dissipated in the long length of flue between. The "blowing box," on the tower top, was a clumsy contrivance, fully ten times as large and costly as it should have been. This is not all. Finding, when it came to be worked, that the Glover Tower was too cold, this engineer who essayed to be chemical, introduced three two-inch leaden pipes at a few feet from the bottom of the Glover, passing right through to the other side, and perforated right and left from end to end. He connected these to the steam boiler, opened the valves to "full on," and blew steam at 30-40 lbs., at least, into the tower, to "get the heat up." That he accomplished some denitration goes without saying, but this we know, that even he had to stop because of the weak acid produced. We may add that the other portions of the plant were as ill-conceived and unsuitable as was the acid plant, and it was only by ways

and tricks worthy of the "Heathen Chinee," that the unfortunate persons who had charge of the processes were able to carry them on in the face of existing legislation. We know of other instances, but this will suffice to show that while engineers were telling the constructive chemist that he was not a chemical engineer, and as good as bidding him stick to his laboratory, they were, by their actions, proving the contrary, and that without him they could not meet the demands of the times. We trust that by this time they are convinced that a man who, from the operations of the laboratory, can evolve a successful ammonia soda plant, or a sulphur recovery process, or other chemical operations on the large scale, dealing successfully with re-actions which have been conducted on quantities of less than a litre in the laboratory, is something more than a mere engineer, is in fact a Chemical Engineer. One word more—our friends the engineers are not quite free from the very fault with which they charged their chemical brother, for is it not true that within the last few years, scores of engineering firms have taken up the manufacture of dynamos and the installation of electric lighting, electrolytic, and other electrical plant, from no better foundation, in some cases, than that they had made patterns and castings for dynamos, which were wound and finished by other persons or firms. Some of these "electrical engineers" could not exist but for the fact that electricians have put into their hands direct reading volt and ampere meters. Where would they have been if they had to use the tangent galvanometers, etc., as of old?

RIVER POLLUTION.

A ROCHDALE correspondent writes:—The Corporation of Rochdale has not only done more than any other town on the banks of the Roach and Irwell to prevent the pollution of these rivers, by the laying out of a sewage farm, but they are now engaged in making considerable extensions at their sanitary works with a view of further improvement, so that the effluent into the Roach (which is a tributary to the Irwell) may be still clearer, and that as far as the Rochdale Corporation are concerned, the authorities of the Ship Canal may have nothing to complain of. As the sanitary works at Manchester, Warrington, Birmingham, and Stafford are the only towns in which the fæces and refuse are manufactured into manure on somewhat similar lines as at Rochdale, and as of late there has been a discussion in Manchester with respect to this system, it may be interesting to record a few facts as to the result of the working of the system at Rochdale, where it was first originated by Mr. Alderman Edward Taylor, and now by careful observers is believed to take the lead in points of efficacy and economy. As far back as 1868 the Rochdale Town Council decided to adopt the pail system, for the purpose of improving the sanitary state of that town, the atmosphere of which was then much polluted by the old plan of open receptacles. The manufactory, which is nearly in the centre of the borough, is 120 yards in length by 40 yards in width. Ninety-seven men are employed and 34 horses. The manure, it is stated, contains nitrogen equal to 8½ per cent. of ammonia, and phosphoric acid equal also to 8½ per cent. of tribasic phosphate of lime. In the alkaline salts there is 5 per cent. of sulphate of potash. At the present time house refuse reaches 267 tons per week, and the pail contents 150 tons. There are 16,971 houses now within the borough, accommodated with 12,266 pails, and those under the old system now only number 159, with 28 cesspools and open receptacles, and these are being gradually reduced in number. The new machinery that is to be placed in the works is about 50 per cent. larger in capacity than the old machinery. This year there have been made 590 tons of manure, and it is largely sold in Lancashire, Yorkshire, Cheshire, Kent, and Jersey. There are no complaints from the residents in the neighbourhood of the works as to any effluvium, and a Government inspector, in his report to the Local Government Board, referred to the success of the works, and also stated that a better class of houses had been erected in the immediate vicinity. In fact some houses have been built within 100 yards of the manufactory. There has been a wonderful improvement in the health of the inhabitants of the town, and consequently the death rate is lower. When the system was first brought into operation the death rate was 26 per 1,000, and it is now 18 per 1,000, which is lower than any other town of a similar size.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Buckley.—Fireclay ware of all kinds—Slabs, Blocks, Bricks, Tiles, "Metalline," &c.

Chadderton Iron Works Co., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, Plaistow, Essex.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

Galloways, Limited, Manchester.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co. Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters.

Joseph Kershaw and Co, Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Meldrum Bros., Manchester.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.—Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

Legal.

IN THE CHANCERY DIVISION OF THE HIGH COURT OF JUSTICE.

On Friday, *before* Mr. Justice Kay.

WARDLE AND SONS v. GOLDSTRAW.

This was an action by a firm of silk dyers, carrying on business at Leek, to restrain the defendant, who had formerly been employed by them as foreman, from committing a breach of the agreement into which he had entered with them, and whereby he, in effect, bound himself not to follow, use, or carry on the business of a dyer, or enter into the service of any other firm, or communicate any trade secrets, within 20 miles from the town of Leek. It appeared that a firm of Wardle and Davenport, manufacturers of sewing silks, carrying on business in or near to Leek, had been customers of the plaintiffs, and had from time to time purchased sewing silk from them. The defendant had recently given notice to quit the service of the plaintiffs, and had entered into the service of Messrs. Wardle and Davenport, who employed him as a dyer of silk.

Mr. Marten, Q.C., and Mr. Butcher appeared for the plaintiffs; and Mr. Renshaw, Q.C., and Mr. Mulligan for the defendant.

Mr. Justice Kay, in delivering judgment, said that the law in reference to contracts of this kind had been illustrated by very many decisions of the Courts. Two things were quite settled. One was that where there was a limit of space specified, if that limit was not wider than was required for the protection of the employer in his trade, an agreement, such as the present one was not in undue restraint of trade. The reason had been given many times. A workman who entered into such an agreement had more secrets of the trade shown to him, and was better trained and treated, and earned higher wages, than one who did not enter into such an agreement. Therefore, an agreement of this kind, if the limit was not too wide, was upheld by the Court. Another thing which was quite settled was that the Court would not weigh in golden scales the amount of the consideration which must be given for such a contract. In a case such as the present, where the person employed had had his wages increased from time to time since he signed the agreement, the Court would consider that there was a sufficient consideration. Here the agreement was entered into on the 28th of March, 1885, and it was not until the year 1890, when he had had his wages twice increased, that the defendant gave the notice. Then, was the limit too wide to protect the plaintiffs' trade? On that point the evidence was quite satisfactory. It was proved that the principal part of the silk trade was carried on within the distance of 20 miles from Leek, and that the chief competitors of the plaintiffs traded within that radius. They were not, however, the only dyers, because it appeared that there were dyers of sewing silk carrying on business in Manchester. His Lordship referred particularly to the terms of the contract in reference to a contention that had been raised that one clause of it was to be read as unlimited in point of space, and, therefore, bad in law, and observed that the Court, in reading the agreement, was not bound to adopt such a construction as would destroy it. It was a lawful agreement if it did not go too far; and a construction which would make it go too far ought not to be adopted if there was another reasonable construction which would bring it within the limit allowed by law. In the present case the common-sense view of the contract was that it was intended to be limited in regard to space. It was said that it was too wide because it prohibited the defendant from entering into any service whatever. But on a fair construction of the whole agreement that was not a reasonable view. On the part of the plaintiffs it was said that in the carrying on of their silk trade there were certain trade secrets, and that the plaintiffs were very anxious that these should not be communicated to other traders. Persons who knew nothing whatever as to what went on at the plaintiffs' works said that they did not believe there were any such secrets; but evidence of that kind produced very little impression on his Lordship's mind. But if confirmation of the plaintiffs' statement were wanted it was to be found in the anxiety which the present employers of the defendant showed to take him into their service. They had filed several affidavits in defence of his conduct. The reason of their anxiety was clear. They had hitherto had their silk dyeing done by the plaintiffs, and they were very desirous of having their dyeing done in the future by the man who possessed peculiar skill, which he had learned in a long course of business in the employ of the plaintiffs. His Lordship always regarded the evidence of acts more than that of sworn affidavits, and here was an act on the part of the present employers of the defendant which was, to his mind most eloquent. The allegation of the plaintiffs was that the defendant was possessed of information the communication of which to others would be prejudicial to them; and that was, no doubt, the main reason why this firm had employed him. The conduct of the defendant had been deliberate, and an injunction must be granted restraining him until the trial of the action from acting in violation of the terms of the agreement.

COURT OF APPEAL.

(*Before* Lord Esher, Lord Justice Lindley, *and* Lord Justice Bowen).

BODEN AND CO., APPELLANTS; THE OVERSEERS OF CHARD, RESPONDENTS—GIFFORD, FOX, AND CO. *v.* THE SAME.

This case raised the question, not strictly of rating machinery, but as to enhancing the rateable value of premises by reason of the machinery. There were two cases in which the question was raised, both cases of lace factories at Chard, and in both of which it was admitted that the rateable value of the premises rated had been considered by the assessment committee as largely enhanced by the machinery. The sessions at Taunton had upheld the rating, and on appeal to the Divisional Court, this decision was affirmed—that is, it had been held that the rateable value might be taken to be increased by the value of the machinery. In fact, the value had been enhanced to the extent of four times the rateable value of the premises. In one of the cases, the total rateable value had been made £1,090., of which £200. was for the value of the premises, and £800. for the machinery. Both cases were heard together, and it was admitted that to some extent, the question had been determined by the Court in the "Tyne Boiler" case (18 Q. B. Division Reports), in so far as the Court then expressed an opinion that to some extent, the value of the machinery might be taken into consideration; but the question now was raised on what principle the assessment should be made. It was agreed to take the case of Gifford and Co. first, in which it was admitted that the total rateable value was £1,095.—that is, £297. for land, building, and fixed motive power, and £800. for the machinery. The machinery taken into account was the "bobbinet" machines, as they were called—frameworks fixed to the floor so as to steady them, but not so fixed as to be made part of the buildings; and it was admitted that the machines might be removed, though necessary for the use of the premises as a bobbinet lace factory. It appeared that the sessions had approved of the estimate by the assessment committee of the rateable value of the premises on the footing of the annual sum for which the premises might be let along with the machinery. This was disputed by the tenants, who appealed against the decision upholding the assessment.

Mr. Hugo Young appeared on the part of the tenants, the appellants, and argued the case for them—contending that in effect the Assessment Committee had rated the machinery. He admitted that by the decision of the Court in the Tyne boiler case the value of machinery might to some extent be taken as enhancing the rateable value of the premises. The way in which machinery was rateable—[Lord Esher—You must not use that expression; you must not assume that machinery has been rated; it is a question as to enhancing the value of the premises by reason of machinery.] No doubt that was the way in which it was put by the Court in the case referred to, and the principle must be limited in its application, or goods would be rateable. The value of a farm might depend upon the machinery, &c., but would the machinery increase the rateable value? So the value of a clothier's shop would depend upon the sewing machines, but would they increase the rateable value of his shop? The premises here might be used for other purposes if the machines were removed. [Lord Esher.—Not as a lace factory.] But the rateable value of premises cannot depend upon the particular use to which they are applied. [Lord Justice Bowen. How do you distinguish this case from the Tyne boiler case?] The machines here are more in the nature of chattels than in the former case. [Lord Esher.—You would make a factory a building within four bare walls, apart from everything which gives it value. But Lord Campbell long ago laid it down that a factory must be rated according to its value as combined with machinery—without considering whether the machinery is attached to the building &c. [Lord Justice Bowen.—Was it not laid down in the Tyne boiler case that the machinery need not be fixed to the building?] It was so, no doubt; but the application of the principle must be limited in some way or it will include furniture in a furnished house as raising the rateable value of the house. [Lord Justice Bowen.—Is not the test this—what would pass to a purchaser on a sale of the premises?] True, that was a test put; but surely these machines would not pass on a conveyance of the factory. [Lord Esher.—The principle laid down in our former decision was that all things on the premises necessary to the use of the premises for the purpose for which they are used, and which are not intended to be removed so long as the premises are used for their present purpose, may be taken into account in estimating the rateable value of the premises. These machines are not essential to the use of the premises. [Lord Esher. —Yes, as a lace factory.] They are removable. [Lord Esher. Some of them are so heavy as not to be required to be fixed at all except by their own weight.] If that is

sufficient it is difficult to put any limitation on the application of the principle. And if the whole rent is that which would be given for the premises with the machinery, then in effect machinery may be rated.

The Attorney-General (and Mr. Douglas Metcalfe), on the other side were not called upon.

The Court upheld the judgment and dismissed the appeal.

Lord Esher said he had sought in the Tyne boiler case to give a good working rule, and he could not improve upon it. Things like sewing machines, not necessary to the use of the premises, were not to be taken as enhancing the value of the premises, but machines, whether fixed to the floor or not—if necessary to the use of the premises as such, and going to make up the value for which the rent was paid—might be taken into account in estimating the rateable value. These cases clearly came within the principle laid down, and the appeal must be dismissed.

The Lords Justices concurred.

Appeal dismissed.

SOCIETY OF CHEMICAL INDUSTRY.

ANNUAL GENERAL MEETING.

ACTING on the invitation of Professor Clowes, given at the last Annual General Meeting, in London, the Society this year held its gathering in Nottingham, a town excellently suited for the purpose, as it is both easily accessible from all parts of the country, and is the centre of numerous interesting industries. On Wednesday, July 9th, some 200 members, most of whom had arrived overnight, met in the lecture room of the chemical department of University College, the Mayor of Nottingham receiving them, and remaining until compelled to depart by reason of stress of municipal business. After a statement of the general condition of the Society from the Secretary, Mr. C. G. Cresswell, a statement which proved of a thoroughly satisfactory nature, and an account of its financial position from the honorary treasurer, Mr. Rider Cook, whose communication was equally encouraging, and the election of officers and council for the coming year, the President, Sir Lowthian Bell, read an address on the Chemistry of the Blast Furnace.

Looked at superficially, nothing could well be simpler, for every text book stated that the process was merely one involving the reduction of iron from its oxide, the carburetting of the reduced metal, and the fluxing of impurities by the limestone fed in with the ore. Endeavouring, however, as the industrialist must, to give quantitative expression to the reactions occurring, that knowledge of the limiting factors of economic production might be gained, difficulties were encountered hitherto unsuspected, and new facts brought to light. It was well known, as stated in ordinary treatises, that reduction took place in the upper portion of the blast furnace, before the zone of fusion was entered, but few were aware at how low a temperature reduction began. Sir Lowthian Bell's own experiments had led him to consider that the reaction commenced at so moderate a temperature as 150° C., and in view of this fact, the saving effected by the absorption of heat by the mass of fuel, flux and ore, in the upper part of the furnace, became very evident For economical working, it was obvious that as large a proportion of the carbon of the fuel as possible should be completely oxidised to carbon dioxide, but, although it was certainly possible to reduce oxide of iron with carbon monoxide, yet under the conditions that obtained in the blast furnace, there was always a tendency towards retrogression, and it was found impracticable to utilize the carbon at this part of the process to the fullest theoretical extent. All the more was it necessary to study the conditions the fulfilment of which conduced most largely to this result, and research in this direction was of the utmost value The two most noteworthy stages of evolution through which the process of iron smelting had passed, were the introduction of the hot blast, and the very considerable increase in the size of the furnace. Neither of these was approached from a scientific standpoint. Contemporary chemists were well aware of the difficulties involved, while as yet, the knowledge at their disposal was inadequate to meet them, and it was left to men who, though not belonging to that class of persons who rush in where angels fear to tread, yet had something in common with them, to wit, their ignorance and self-confidence, to effect these radical changes, and the result justified their rashness; unaware of the difficulties which encompassed them, and even not aiming at economy, but rather at larger output, they had achieved a diminution of the quantity of fuel requisite that was as considerable as it was unlooked for.

This method of investigation was not, however, without its dangers. Finding that larger blast furnaces and a higher temperature for the blast gave better results, the obvious, but risky reasoning, that increasing both these would *pari passu* augment the advantage gained, had been adopted, and the deductions arrived at put into practice. What was the result? No further economy had been obtained, and the experimenter was not recouped for his extra outlay. A similar result attended the use of limestone causticised before entering the blast furnace; it seemed a good notion to lighten the labour of the furnace by relieving it of the necessity of driving off carbon dioxide before the flux could be available, but as a matter of fact, caustic lime tended to become recarbonated before it could reach its zone of activity, and the carbon dioxide it had picked up had to be expelled, just as if raw limestone had been used. Sir Lowthian said that his experience (and it is no slight one) led him to prefer to any sensational size of furnace, temperature of blast, and so forth, a furnace of moderate size (*e.g.* 80 ft.) fed with air at a temperature needing no special effort to attain, and supplied with raw limestone, and the figures he presented to the meeting bore out his assertion. The paper concluded with an account of the experimental work which had been necessary for arriving at these results, many of which were given in the form of two voluminous tables.

At the close of the address thanks were tendered to the President, and it having been announced that the next annual meeting would be held at Birmingham, the assemblage dispersed, some going to the Midland Railway Works at Derby, while others inspected the local leather and hosiery industries in the town itself.

On the arrival of the former detachment at Derby, the members were entertained at luncheon, and proceeded to view the works, a portion choosing the carriage departments, while others went round the locomotive shops. In the former, wood-working machinery of great interest was examined, while the finishing and upholstering attracted much attention. In the latter, after distribution of the party into groups, each with its guide, a move was made for the laboratory, which was found to be in a model condition, presenting a great contrast to some works' laboratories that occur to us. Here the raw material, iron and steel, is analysed, but besides this, which is perhaps the staple article examined, the quality of the various stores, such as oils and paints, of which a big railway company is inevitably a large consumer, is ascertained. All practising chemists, whose work leads them to the examination of such articles, know how necessary is a strict watch on the enterprizing efforts of the artful adulterator, rape oil alone being sufficient by its mere mention to suggest vigilance, and here a strict scrutiny on that commodity is maintained. We were, however, somewhat surprised to gather from our cicerone that brass boiler tubes, of which an enormous number are used in locomotive construction, are not analysed in this laboratory. Being personally accustomed to examine them constantly for railways, some of which are of far less importance than the Midland, and being keenly alive to the necessity for so doing, we confess that we can scarcely understand so remarkable a state of things. Leaving the laboratory, our obliging guide, Mr. Davis, whose services in this office are widely known and appreciated, led the party to the shop where crank axles were being machined; the modern crank axle is roughly twisted into shape while white hot, and then turned and slotted to its ultimate dimensions. It is now the practice of the Midland Company to bind and pin together the webs so that in the event of fracture while running the parts may be held in position until the train can be stopped, and thus the disastrous effects of a broken crank-axle avoided. An attempt has been made to cast eccentrics on to the finished axle, but at present without success. It is noteworthy that the power requisite for each shop is generally supplied by an old loco motion put with a vertical frame, and run from a series of old loco boilers, which are thus utilised. A row of them is connected with a common steam pipe, a reducing valve being inserted to bring the pressure down somewhat, and provision made for cutting off any one of them for cleaning or repairs; to facilitate removal, all the boilers are slung from a girder, and can be picked up, run away, and replaced most expeditiously.

In another part of the works is found a complete steel-making plant, idle. The reason for this inactivity leads to the discovery of an interesting point in commercial ethics. The main part of the returns of the Midland Company is obtained from mineral traffic, and when their customers for this class of goods heard that they contemplated producing their own steel, they simply dared them to do so, and the company, perhaps wisely, did not dare, *hinc illæ lachrymæ*.

A fearful clangour tells us that we are approaching the boiler shop, and explanation is chiefly in dumb show. The boiler shells are rivetted up quickly and effectively by a steam rivetter, no hydraulic arrangement being in use. In a special house and a high state of polish, moving most deliberately, is found the pumping engine for supplying the whole of the works with water, an ample supply being kept in a large tank on the top of the building. After the steam hammer department, where, among other operations, scrap of all kinds is worked up, and the tyre shop had been visited, the repairing shop was reached, and the process of facing up a worn valve explained, after which the foundry was visited, the company doing their own casting from chairs to steam domes. The recovery of brass scrap is effected by a Fletcher's apparatus consisting essentially of a pan in which the brass ashes are cleaned by a rotating water-jet washing away the lighter particles of dirt. Everything that can be is done on the premises, with the, perhaps solitary,

exception of making railway grease, the works being a complete microcosm. In the erecting shop many interesting facts were noted. Wood lagging is now practically abandoned, its place being taken by silicate cotton, which is found to be in many ways preferable. A special contrivance is used to prevent the access of small fish or spawn to the feed water, as their presence in the boiler is objectionable, it being found that they injure the action of the injector. It having been observed that the top of the smoke-stack of a loco. wears out soonest, the Midland Company are now fitting removable tops, which can be cheaply replaced. The finished engines are painted with elaborate care; the Dutch say that paint costs nothing, and this is true when there is costly machinery to be preserved; repeated coats frequently rubbed down, followed by four or five layers of quick-drying varnish, give the locomotive its splendid finish, red oxide being used for the goods engines and lake colours for those for passenger traffic.

At the end of a most interesting and instructive visit the return journey was made to Nottingham. In the evening the Mayor held a soirée at Nottingham Castle, which was numerously attended. On Thursday many works in the neighbourhood claimed attention, and a contingent went to the Butterley Iron Works, but the bulk of the members started for Burton-on-Trent. Here the five great breweries, representing the staple industry of the town, received the society, and the party having divided itself into groups, so that a moderate number might visit each, a tour of inspection was made. The brewing process at Burton is, in outline, that usually pursued; the pre-eminence of Burton ales being partly due to the famous water found there, and partly to native enterprise, but there are details which are characteristic of the district. Such for example is what is known as the *union system*. After the wort has been fermented into beer, the yeast is separated and the liquor cleared by filling the turbid liquid into casks provided with an outlet tube on the upper side, which rises a few feet and dips downwards into the yeast trough, as it is termed. Fermentation proceeds in the barrels and the yeast is gradually forced up this pipe and drips into the trough, the cask being meanwhile kept full of beer by a separate supply. The temperature of both barrels and trough is regulated by tubes carrying cold water passing through them. On the completion of the clearing, the beer is drawn off by a cock on the the lower side of the cask, the end of which projects some inches within the cask so as not to disturb the sediment. By this method a specially bright product is obtained.

After having been shown round the town, the various parties assembled at St. Paul's Institute, where luncheon had been provided, and enjoyed the hospitality of Burton Brewers, the quality of which may be deduced from its source, for Burton is proverbial in this respect. The society having expressed its sense of obligation for its courteous reception through Mr. Mond as its mouthpiece, returned to Nottingham about half-past four In the evening, the annual dinner was held at the Exchange Hall, and passed off without a hitch. Rain marred the excursion to the Dukeries next day to some extent, but the majority were not daunted, and, despite their late exertions, mustered strongly. There is no doubt that the meeting was one of the most successful which the society has held, and the Nottingham section has reason to be proud of the way in which it entertained its guests, and the universal satisfaction which resulted.

BLANDITE.

MANIFOLD have been the attempts to produce a material that will effectively take the place of India-rubber for some of the various purposes to which this most useful gum has been turned to good account, both for mechanical purposes and also for wearing apparel. Although some have resulted in the production of substances which have fulfilled some of the requirements anticipated of them, there still remains the fact that nothing has yet been produced that will thoroughly answer as a substitute for raw rubber in all its many uses of the present day. One of the latest of these fabricated substances that has come to our notice is the invention of Dr. A. A. Blandy, of 58, Brook-street, Grosvenor-square, who has been experimenting for some time past to produce a material which will eclipse leather in its wear-resisting nature.

Experiments of this sort are often attended by the unexpected discovery of a material having other qualifications, and this has been Dr. Blandy's experience. He has, however, submitted to us a number of samples of his Blandite, for which it is claimed that while it can be produced at a price less than even waste rubber can be bought at, it is admirably suited for numerous purposes. Among the many substances we saw we must especially notice some sheets of this material, which at first sight appear to be rubber, but there is really no rubber at all in the composition. It is fairly elastic, stretching about twice its length, and returning to its natural size; it is very pliable, and does not show any signs of cracking when bent about in every direction; it can be easily vulcanised, like ordinary rubber, at a temperature of about 270° to 280° Fahr., some samples which had been subjected to the action of 15 per cent. and 50 per cent. dilute sulphuric acid for some considerable time remained perfectly uninjured, while in a plastic state it can be readily moulded into any desired form. The samples we saw had only been manufactured by hand, and consequently were not so perfect as if made by machinery, with proper moulds, &c. For insulating purposes it seems to answer all requirements, having stood the following tests:—

"It becomes soft and pliable at quite moderate temperatures, resisting more heat than gutta-percha; but on heating for a day or two at 100° C., it apparently loses some volatile oil, or becomes oxidised, and, as a result, becomes much harder, and will no longer soften under heat; it still, however, remains fairly pliable.

"The first test proved conclusively that your insulator is admirably adapted to cable work, as a very thin coating of it prevented contact through a bath of sulphuric acid and water, a 10-volt current being used."

For battery cells this material has proved very effective, and, as a substitute for leather, from practical tests it has been found very good. These are only a few of the purposes to which this material has been as yet applied; but we believe that when it is worked by machinery it will be found adaptable to numerous other purposes, and as it mixes readily with India-rubber and gutta-percha there is doubtless a great future before it.

THE PHOSPHORESCENCE PRODUCED UPON THE FIRST CONTACT OF OZONE WITH CERTAIN FLUIDS.

[BY ERNST FAHRIG.]

SOME years since, in experimenting with some new liquid preparations of ozone, I accidentally observed a phenomenon, which immediately attracted my attention and led me to make many more experiments upon the subject. But these further tests, instead of clearing up the mystery by affording a definite explanation of the peculiar action produced, only mystified me the more. For they merely served to upset the various theories and explanations which have, from time to time, suggested themselves, not only to myself, but to scientific friends to whom I have mentioned the matter; and, in my own view, they render no less untenable a theory which has been publicly advanced by some others who have independently discovered and worked in the same field; and to which I shall presently refer. Thus perplexed, I have resolved, with the Editor's kind permission, to publish an account of these experiments in this journal, in the hope that someone among its wide circle of readers may be able to throw some fresh light upon the question.

My first observation of the phenomenon was in the following manner:—I was in a dark room, and having a sealed bottle partly full of a preparation of ozone (in this instance, a solution of ozone in water containing a small percentage of other substances such as I have found in the course of my experience are necessary to retain the ozone in solution) in my hand, I, idly, and with no particular purpose in view, gave the bottle a vigourous shaking up. Instantly, I saw a soft phosphorescent glow of light floating above the surface of the liquid and permeating the space in the upper part of the bottle. Its appearance was only momentary; but, on shaking the liquid up again immediately afterwards, the light appeared again, but in much diminished intensity; but further repititons failed to produce any results. After an interval of ten days, however, the bottle of liquid had apparently regenerated its power, and the same effects could be observed, though weaker.

I observed the phenomena in another way, and obtained some especially remarkable results by pouring a small quantity of an ozone solution into a glass beaker containing ordinary water. At first, the cone-like projection of the solution, where it falls into the water, becomes luminous, and then the light suffuses the whole mass as the liquids become thoroughly mingled, and finally disappears.

Similar experiments to this have since been successfully carried out by the gentlemen whom I above mentioned as having worked in this direction; and it is doubtless upon consideration of this particular variation of the phenomenon that they have based their theory.

Now it does not seem probable that the luminosity can be due to a purely chemical action among the various inorganic constituents brought together; for a careful consideration of the properties and chemical reactions of these does not indicate the likelihood of any such action taking place. I have found indeed that it is essentially dependent upon some peculiar property of the ozone, and that it is in no wise influenced by the medium, solvent, or condition in which this is presented to the water. That is to say, the appearance of the phosphorescence is not thereby interfered with in entirety; although there is some difference of degree in the intensity produced. Thus, with

preparations of ozonised oil the same effects occur, and also with ozonised air or the pure gas itself. The latter is applied by means of a glass tube immersed in the water, and with this method there is a marked increase in the duration and intensity of the phosphorescence. Or an easy way, somewhat similar to my first experiments, of observing the effect is to take a bottle partly full of ordinary water and confine ozone gas or ozonised air in the remaining space; when shaken up in the dark the upper part of the bottle is seen to become permeated with the light.

Trying the experiment with other substances in place of ozone I every time failed to produce the least appearance of the phenomena. Thus chlorine, an element, which in the striking similarity of its reactions to those of ozone, exhibits a remarkable analogy to that gas, so much so that it is extremely difficult to test or distinguish between the two, absolutely would not afford the slightest glimmer of light, although it of all other substances should be the most likely to produce analogous effects to those of ozone. To be quite certain upon this point I applied the chlorine in a great many different ways and conditions, but always with the same negative results. Thus free chlorine gas, chlorine water, chlorinated soda, hypochlorites, chloride of lime and ordinary bleaching liquors were all subjected to experiment, and in every case, as with numerous other substances, peroxide of hydrogen included, the already strongly established conclusion was confirmed that the phenomenon is wholly and solely due to some remarkable action of the ozone, and to electrically produced ozone alone.

Having satisfied myself of this in a sufficiently exhaustive manner, I turned my attention to the water into which the ozone preparation was poured and endeavoured to determine how variations in its quality and source might influence the effects. In this direction I met with a series of most strangely conflicting results. I found that some samples of water would duly give off the momentary glow of light upon the application of the ozone, while others would not; but the most curious fact was that examination or analysis of the various samples failed to discover any cause to which these positive and negative results might be assigned, or any explanation by which they might be reconciled. In river water the light was very good, in some from a deep well there was none whatever. In sea water there was none, and altogether there is a great and inexplicable uncertainty about the probable behaviour of any particular specimen of water, which makes it practically impossible to foretell the result, when first trying the experiment with a new sample; although the characteristic impurities and condition of the same may be well known and understood beforehand. It was owing to this same uncertainty that I was much vexed a short time ago by failure in an attempt to exhibit the phenomena to a party of eminent scientific gentlemen; while on the very next day I was able to succeed with almost identical materials and conditions. Hence the great difficulty of arriving at any plausible explanation.

The theory before referred to, and which is, apparently, the most probable of any that have yet been suggested, is that the light is generated during the destruction or oxidation of the organic matter of the water, or in killing the bacteria or micro-organisms which it may contain. But I think this cannot be sustained in view of the tests made with different samples of water; for it is evident that were this the case the appearance and intensity of the effects would depend upon the presence and proportional amount of organic matter in the water; which, however, does not seem to be at all agreeable with experience.

In fact, I have found that water previously thoroughly boiled and filtered to free it from bacteria and other organic life, does not thereby become indifferent to the experiment, thus furnishing what would seem to be a very strong and direct negative to the aforesaid theory. But, in justice to its exponents, I should add that they deny that it is possible to destroy bacteria by boiling, in which statement they are, I understand, supported by the great bacteriologist, Dr. Koch; and they further affirm that this important office can only be effectually performed by means of ozone. If they are right in this contention, their theory must, of course, be allowed to stand; but, to prove it thoroughly, it will be necessary to show a closer connection between the intensity of the phosphorescence and the observed proportion of micro-organic life, than can at present be said to exist.

As to the light itself, I can only describe it as a soft phosphorescent glow, which quickly spreads over the mass of fluid or gas, as the case may be, and as quickly disappears. It is very similar in appearance to that in another phenomenon, which, I believe, I was the first to observe, some ten or twelve years ago; and of which, also, I have been unable to find any satisfactory explanation. It is that when the globe or bulb of an *old* incandescent lamp is lightly rubbed with the hand, and then immersed in water slightly warm, or simply breathed on; a distinct light is observed to be diffused through the globe—in the dark, of course. I have laid especial emphasis upon the fact that the lamp must be an old one, because herein lies the peculiar point of the experiment.

At first sight one naturally supposes that the same results can be obtained with an ordinary piece of glass; but this is not so: neither does it appear to the experiment be excited in a new or unworked lamp. Of this I fully assured myself by making lamps specially for the purpose and subjecting them to tests to see if this was not some hitherto unobserved property of an exhausted bulb of glass. Therefore, as the vacuum pure and simple is not the cause, it would seem that the light is in some way dependant upon some sort of chemical change in the minute quantities of gases remaining in the bulb, produced by long contact with the incandescent filament. Gaseous compounds may be thus formed, which, under the condition of extreme rarification, may have the property of phosphorescence when subjected to electric strain. Still this does not leave the reason for moistening the bulb at all clearly defined, though the function of this process is doubtless to accomplish a rapid discharge of the electricity generated by the friction of rubbing.

In conclusion, I may throw out a suggestion that the light in the first case is due to the release of the energy stored up in the ozone at its creation, but I will say nothing as to its plausibility, or as to how it appears to meet the case.

Analytical Notes.

NEW METHOD FOR DETERMINING COMBINED CARBON AND GRAPHITE IN IRON AND STEEL.

Petterson and Smitt have devised a method distinctly novel in principle, and which, moreover, determines the combined carbon directly. 0·4—0·8 grm. of the metal in the form of thin plate filings or turnings, is fused with potassium bisulphate, the iron dissolving with liberation of sulphur dioxide and the combined carbon oxidising to carbon dioxide, while the graphite remains unattacked. The evolved gases are absorbed by a mixture of caustic soda and baryta, the barium sulphite resulting oxidised to sulphate by a small excess of permanganate, and the carbon dioxide determined by any convenient process such as Petterson's recently-devised volumetric method. The graphite is filtered from the aqueous solution of the melt on to a platinum-asbestos filter, gently heated, weighed, ignited in a current of air laden with nitrous fumes, and re-weighed, the loss of weight indicating its amount. 0·2—0·3 grm. of metal suffices in the case of cast iron.—*Chem. Zeit.*

A SIMPLE TEST FILTER.

In determining the end point of a reaction in volumetric work it is sometimes necessary to filter a small portion of the liquid being titrated, and for this purpose sundry filter tubes have been devised, and are described in the ordinary text books. A notable simplification of these consists merely of a glass tube 25—30 cm. long, and about 5 mm. in diameter, having the lower end ground true. A little piece of filter-paper about 1 cm. square is moistened with a drop of water and stuck on the lower end of the tube, which is then immersed in the liquid to be tested; by sucking gently at the upper end some of the liquid is filtered through the paper-closed end and rises clear into the tube. The piece of paper itself may then be allowed to fall back into the bulk of the liquid, leaving a small quantity of filtered liquid in the tube, by which it may be removed for testing.—*Chem. Zeit.*

A NEW METHOD FOR DETERMINING STARCH.

A method for the direct determination of starch has long been wanted, and a process for that purpose appeared in a recent number of the *Chemiker Zeitung*. 2·5 grams of the substance are shaken with 10 c.c. of water in a flask of a capacity of about 200 c.c. until thoroughly moistened, 180 c.c. of neutral zinc chloride solution, sp. gr. 1·45, are then added, the mixture heated in a brine bath to 108° for about 1½ hours, made up to 250-253 c.c., according to the bulk of the insoluble matter, filtered, and 25 c.c. of the filtrate acidulated with 2 c.c. hydrochloric acid to prevent precipitation of zinc oxychloride, and precipitated with 75 c.c. of 90% alcohol, or 62·5 of 95%. Starch and dextrin come down, while sugar remains in solution; after settling for 24 hours it is filtered through a weighed filter, washed by decantation with 90% alcohol at first slightly acid with hydrochloric acid, but afterwards neutral, dried, weighed, ignited, and the ash deducted. The precipitate of starch and dextrin usually contains a small quantity of nitrogenous matter, but this can generally be determined once for all for each kind of substance operated upon, and a correction made.

A New Source of Benzole.—There is balm in Gilead, or what amounts to the same thing, benzole in Baku. Even if by the operation of the Dinsmore process, benzole from coal-tar becomes a chemical curiosity, as was threatened a little while back, we can still import it, for according to the *Chemiker Zeitung*, Rothschilds is putting up works to obtain it from naphtha residues at Baku. The process has proved efficient on the small scale, and is said to have been actually worked in Russia for some time, so that tangible results may be expected.

THE IMPOVERISHMENT OF LAND BY NITRATE OF SODA.

IT is stated that nitrate of soda, while largely increasing the yield, rapidly deprives the land of its phosphoric acid. This, if it were true, would be a serious drawback to the use of nitrate fertilizers, but the statement has been refuted on scientific grounds. As a matter of fact, the nitrate, in addition to producing its principal effect, dissolves the difficultly soluble phosphates of the soil, and renders them more accessible to the plants. The increased crop, which results, not only withdraws more nitrogen from the soil, but also more phosphoric acid than a poorer crop. The consequence of this is that land which is plentifully treated with nitrates also requires a large amount of phosphoric acid.

Some experiments carried out in Germany, on peas, gave the following results:—

1. Without manure..... 100 crop.
2. Fertilized with nitrate and potash ..... 111 ,,
3. Fertilized with nitrate of soda, potash, and phosphoric acid ..... 137 ,,

From these numbers it might appear that in experiment 2, the plants had not been able to take up from the soil the amount of phosphoric acid necessary for the production of the maximum yield of 137 obtained in experiment 3, when phosphoric acid was added. The chemical analysis of the product, however, contradicts this theory, the results obtained being as follows:—

1. Without manure..... 100 phosphoric acid.
2. Nitrate and potash ..... 145 ,, ,,
3. Nitrate, potash, and phosphoric acid ..... 140 ,, ,,

The plants of experiment 2 had, therefore, taken up as much phosphoric acid as those of experiment 3. The phosphoric acid present in the soil and brought to the plants by means of the nitrate and of the potash, has, however, not been able to produce the same yield as the same (or nearly the same) amount of phosphoric acid absorbed by the plants of experiment 3, from the superphosphate fertilizer.

The reason of this is to be sought for in the fact that the phosphatic manure has rendered it possible for the plants to absorb large quantities of phosphoric acid from the beginning; it has furnished the necessary phosphoric acid at the right time, while the plants fertilized with nitrate of soda were at first deprived of phosphoric acid. It is true that subsequently the solvent action of the nitrate of soda and of the potash has enabled the plants to gradually take up, during their entire period of growth, as much phosphoric acid as those in experiment 3, but this acid, coming *too late*, remained without effect. This fact appears to warrant the conclusion that a fertilizer of nitrate of soda and potash enables plants to assimilate phosphoric acid which would otherwise be lost. This absorption, however, and this is of great importance in practice, *only takes place when the soil has not received any phosphoric acid;* that is to say, when the soil is unable to furnish the plant with the necessary phosphoric acid at the period of its development when it is of most use.

To recapitulate: a soil *rich* in phosphoric acid fertilized with nitrate of soda supplies the plant with the necessary phosphoric acid from the beginning, while land *poor* in phosphoric acid, fertilized in the same manner, only gives up its phosphoric acid to the plant when the latter is so far advanced in growth that it cannot make full use of it. Hence the apparent paradox that the phosphoric acid of a rich and well-manured soil is more profitable to the plant than that of a poor soil, and that it is only in poor soils that a fertilizer of nitrate of soda impoverishes the soil when it has not been supplied with phosphoric acid and only contains very little of it.

In practice, therefore, it is necessary to take great care to insure the presence of phosphoric acid conjointly with nitrate of soda and salts of potash, in order to avoid a tardy absorption of phosphoric acid, and to increase the absorption of phosphoric acid as much as possible by the effect of the nitrate.

If this rule be followed, there is no danger of impoverishing the soil by the employment of nitrate of soda. We may add that its price is actually very low, and that it presents many advantages over other nitrogenous fertilizers.

THE SMALLEST DYNAMO.—Prof. Eli. Thompson has just put an Edison phonograph into his office at Lynn, which will be run by the smallest operating dynamo in the world. The dynamo is about five inches long, and its capacity is six watts, or enough to run two incandescent lamps of one-candle power each, that being the service it performed at the Paris Exposition, where it was on exhibition. Six watts represents less than 100th of a horse power.

METALLURGICAL USE OF FLUORSPAR.

FLUORSPAR was, until the commencement of this century, considered an indispensable flux; it diminishes the loss of metal and was then the only energetic means to reduce the melting point of slag from ores carrying a high percentage of clay and zinc. Without fluorspar very refractory ores could not be smelted at all.

Gradually, however, as the blast furnaces and smelting apparatus were improved, fluorspar was superseded by lime and other cheap fluxes, but of late its use has been reintroduced into nearly all branches of metallurgy.

While fluorspar is regarded as a mere means to unite with excessive silicic acid, the possibility of its adoption is surprising, in view of the fact that the cost of fluorspar is six to seven times greater than that of limestone, whilst the formulas for fluorspar and limestone respectively

$$2CaF^2 + 3SiO^2 = 2CaSiO^3 + SiF^4 \text{ and}$$
$$3CaCO^3 + 3SiO^2 = 3CaSiO^3 + 3CO^2$$

show that the quantitative economy in fluxing with fluorspar compared with limestone is as 156 to 300. The fact is, however, that one part of fluorspar goes farther than ten parts of limestone. The former is especially effective in reducing the quantity of fuel; it forms two parts of slag where limestone forms three, and it forms possibly also fluorsilicate, whereby heat is likely to be liberated.

While the rather high price of fluorspar prevents its use in the production of ordinary white and grey pig iron, it has proved a rapid and energetic solvent in blast furnace work, where it is blown in as powder through the nozzles.

In making silicon iron, fluorspar plays a more important part. A ferrosilicon iron, with ten per cent. silicon, made especially in Upper Silesia, is almost indispensable for works that make very tough, deep gray castings. This ferrosilicon can be obtained in any ordinary blast furnace from any silicious iron ore if it is only fluxed with fluorspar and the slag is strongly basic. The fluorspar reduces the silicon energetically; at all events fluorsilicon is formed, which is reduced to silicon by the hydrogen contained in the furnace gases, and possibly also directly by the coke. It does not seem impossible that the greatly increased price of coke will result in a reintroduction of fluorspar as a fuel-saving flux in the manufacture of foundry pig, particularly as even a very small quantity of fluorspar added to the charge, at once raises the product to No. 1 deep gray pig, rich in graphite.

The remarkable property of fluorspar, that it facilitates the reduction of the most different bodies—a property common to almost all the fluorides—makes it a valuable flux in the production of spiegeleisen. It has long been known that fluoride of manganese, as well as a mixture of a manganese combination with fluorspar, can comparitively easily be reduced to metallic manganese by means of sodium. This reaction served Brunner in his successful attempts, the first ever made, to produce metallic manganese in large quantities. The modern application of this method to the blast furnace substitutes carbon for sodium. A highly basic slag, rich in fluorides, seems nearly indipensable for the production of a rich ferromanganese in the blast furnace.

The property of fluorspar, to carry phosphorus into the basic slag, has never been of special importance as far as pig iron is concerned, but it is utilized by the Krupp and Rollet methods of dephosphorizing pig in the basic-lined cupola-furnace. Whilst, at all events in the blast furnace process, the property of fluorcalcium to form an easily melting slag with phosphates is of some importance, fluorspar, in the process of purifying the pig iron, serves probably only as a flux for the highly basic lime-slag saturated with phosphorus.

In the Thomas process too, and even in the Bessemer converter, fluorspar is in recent practice being added in small quantities for the purpose of concentrating the slag and reducing the loss of metal; very great care, however, is needed to prevent such a slag from attacking the acid lining. It is also said that in puddling in the various steel-making methods and in the Siemens-Martin process fluorspar is added partly as a slag-forming flux. The details are, however, not known.

In foundry work, it is an astonishing fact that limestone, which, because of its cheapness, superseded fluorspar, of late is losing ground to the latter. The limestone flux in cupola-furnace work serves only to slag the ashes of the fuel, the sand adhering to the pig, etc., no chemical effect on the iron being intended. But the fluorspar affects the iron noticeably, keeps it grey and soft by keeping the silicon as an alloy, whilst a limestone flux favours the tendency of the silicon to slag. Besides, fluorspar carries some phosphorus and sulphur into the slag. Fluorspar makes it possible to melt inferior kind of pig iron and a higher percentage of scrap. But, strange enough, practice has shown that too much fluorspar is rather injurious than advantageous; one reason for this being that the manganese contained in the iron is thereby prevented from slagging.

The quantity of fluorspar which is added to 100 kilograms of pig iron to be remelted, is one-third, or at the most one-half, kilogram. The improvement of the product caused by this flux is specially manifest in the improved cupola furnaces, particularly the Herbert's furnace, which

has much facilitated the utilization of inferior iron for soft castings. The property of fluorspar to protect manganese does not seem favourable enough to offset the injury due to its silicon-reducing power. Its use would, at least, require melting in a basic furnace or as cold as possible.

As the small quantity of the phosphorus and sulphur, which is contained in Swedish charcoal iron, is almost entirely carried off in the comparatively acid slag by fluorspar, this is of prominent importance for the treatment of very pure qualities of iron.

Dr. Foehr states that fluorspar was formerly the most important flux for smelting copper ores in the German stack, as well as in the English reverberatory furnace. The Mansfield copper slate, for instance, was fluxed with up to 10 per cent of fluorspar, the cost of this being about 8 per cent of the total smelting cost. The effect of this flux depended essentially on the volatilization of fluor silicon, whereby the strongly acid slag was reduced in silicon. The introduction of improved and heated blasts in the Mansfield works has almost confined the use of fluorspar to the blowing in of furnaces. Five per cent of fluorspar is commonly added at the start, but the quantity decreases gradually, until after from two to five weeks no fluorspar at all is used. The English reverberatory furnace process fluxed formerly with as much as 10 per cent of fluorspar, but nowadays this takes place only with ores rather rich in arsenic. Fluoride of calcium with arsenic metals, gives very volatile fluoride of arsenic, which, with a reducing flame, easily escapes. The risk of loss involved in the volatile fluoride of copper necessitates the presence of excessive carbon whenever fluorspar is employed in the metallurgy of copper.

While fluorspar is at present of small value in the treatment of copper ores containing sulphur, its property to give very fluid combinations with gypsum and barytes may prove an important means to work poor oxides and silicious ores as well as charges containing azurite, malachite, red oxide of copper, atacamite and earthy red oxide of copper, by reducing the smaller part of the sulphate, and forming a matte very rich in copper, and by forcing its larger part together with the fluoride of calcium into the slag which thereby becomes thin and very fluid. Equal quantities of fluorspar with gypsum or barytes produce the most fluid slag. A significant point, particularly with poor ores high in silica, is that this slag is poor in copper, a fact on which was based the former Frieberg practice of resmelting the copper slag, together with pyrites and fluorspar, thus obtaining copper matte, and poor slag, the intention probably being to enrich the matte in copper and impoverish it in iron.

Fluxing copper ores containing nickel with fluorspar is very favourable for the collection of the nickel in the matte, and has been in use in the Riechelsdorf, Grunthal and Mansfield works. The chemical process is still entirely obscure, and worthy of study in the laboratory. Possibly, nickel arsenic is decomposed in volatile fluoride of arsenic and nickel, which latter goes into the matte. Fluorspar is an almost indispensable flux for making tough copper, and, generally, whenever silicon, which makes copper highly brittle, has to be removed. As a means to produce a matte poor in iron in the reverberatory furnace, a mixture of fluorspar, barytes and quartz is more energetic and rapid than an addition of only the two last named, the proportion of the fluorspar and the barytes being for this purpose as between one and three, whilst the quantity of quartz depends on how much iron the roasted matte contains. Too much fluorspar gives a matte rich in iron. For refining and remelting copper, fluorspar finds a constantly increasing use. Mixed with some soda, it is the most excellent means to remelt copper ingots, and to remove from the metal bath, small quantities of arsenic and silicon. The process is kept a secret; the refining slag is, however, reported to be remelted with gypsum or glauber salts and fluorspar.—*Dr. Foehr in Chem. Zeitung.*

A Decision on the Qualities of Turpentine.—At the Liverpool Police Court last week, before two city magistrates, Messrs. Goodlass, Wall and Co, oil and paint manufacturers, were summoned at the instance of the Mersey Docks and Harbour Board for having deposited on the quay of Queen's Half-tide Dock two tins containing about ten gallons of turpentine, without having them marked, and without notifying the nature of the goods to the dock-master. It was contended that under the 215th section of the Mersey Docks Consolidation Act turpentine belonged to a class of goods of a dangerous nature, but it was pointed out for the defence that the Act made a distinction between dangerous and combustible goods, and that turpentine was classed amongst the latter, and the defendants had been allowed to ship turpentine continuously for the last eight years without any objection. Turpentine would not ignite until it was heated to 103 degrees Fahrenheit, and in looking at ordinary risks a bundle of straw was more dangerous than turpentine. Mr. E. Davis said turpentine would not take fire even if a lighted match were put to it, while spirituous liquors would, such as whisky or brandy. The magistrates dismissed the summons.

Trade Notes.

Messrs. Bracher and Co., the patentees and manufacturers of the Desideratum Mixer and other patented specialities, announce that they have now disposed of their business to Messrs. John A. Gilbert and Company, Limited, Mill and Scale Makers, &c., 2, 4, and 8, Mount Pleasant, Clerkenwell, London, W.C., who will conduct the business as usual, and to whom all communications should be addressed. We notice that the well-known automatic water condensers are now supplied with automatic floats for regulating the water supply, thus dispensing with taps.

A Paste which will Stick Anything.—A paste which will stick anything is said by Professor Winchell to be made as follows:—Take two ounces of clear gum arabic, one and a half ounces of fine starch, and half an ounce of white sugar. Dissolve the gum arabic in as much water as the laundress would use for the quantity of starch indicated. Mix the starch and sugar with the mucilage. Then cook the mixture in a vessel suspended in boiling water, until the starch becomes clear. The cement should be as thick as tar, and kept so. It can be kept from spoiling by the addition of camphor, or a little oil of cloves.

Caledonian Balsam.—At a recent meeting of the French Societe de Therapeutique, Dr. Forne called attention to the advantages presented by a preparation that he had named "baume caledonien," and which appeared to consist of a solution of Kaurigum in an equal weight of 90 per cent alcohol. He stated that it had been used with great success in the treatment of wounds and ulcers of all kinds. When applied to a well cleansed and dried wound it causes a very slight, but brief, sensation of burning, but after a few moments the solvent evaporates, and the resin is left as a very adherent varnish, which is not affected by friction or contact with water. The preparation can also be used advantageously for fixed bandages in the place of the soluble silicate. It was also said to be superior to tincture of benzoin for the obturation of the cavities in carious teeth. Lastly, a liniment made with equal quantities of baume caledonien and olive oil was recommended as an application to burns.

An Easy Way to Silver Glass.—This may be done by dissolving the parts of crystallized nitrates of silver in fifty parts of distilled water, to this exactly six parts of the solution of ammonia is to be added; then one part of tartaric acid must be dissolved in four half parts of water, and mixed with it; and afterwards diluted with five hundred parts of pure distilled water. Having thus prepared the silver solution for use, it is now necessary to clean very carefully the glass we wish to silver, which is then placed in a vessel and the solution poured in. The vessel is next put away into a quiet place, and kept at a temperature of 40 deg. to 50 deg. Centigrade. When the glass is silvered it may be carefully washed in a very gentle stream of water, and then dried at a moderate heat. As the silver would tarnish by exposure to the action of the atmosphere, it is advisable to varnish it over with some polishing varnish. For this purpose amber, dissolved in chloroform, will be found an admirable preparation.—*National Glass Budget.*

Post Dated Cheques not Illegal.—In the Queen's Bench Division, before Lord Coleridge and Mr. Justice Wills, the case of Carpenter *v.* Street raised a question under a misapprehension of the law as to post-dated cheques—whether they are illegal under the Bills of Exchange Act as not being "regular on the face" of them. It had arisen thus. On the 2nd of January, Street drew a cheque on Bosanquet & Co.'s Bank in favour of one Farmer, dating it the 22nd. Farmer passed it to Brown, who, on the 3rd, passed it to Murray, a customer of Carpenter's, another banker, who, not observing that it was post-dated, cashed it for him. Street in the meantime had stopped the cheque at Bosanquet's, so that it was not paid, and Carpenter sued him upon it in the Westminster County Court. The defence set up was that when Carpenter took the cheque it was not "regular upon the face of it," and was not legally valid. The Judge over-ruled the objection and gave judgment for the plaintiff, with leave to appeal. Mr. Watt, on behalf of the plaintiff, urged that Carpenter, when he took the cheque, ought to have seen that it was post-dated. [Lord Coleridge.—What then? Cheques are constantly drawn post-dated. Is it supposed that, therefore, they need not be paid? I don't understand the defence. Mr. Justice Wills.—I believe at one time it was supposed that post-dated cheques were illegal, but after the penny duty was imposed it was held otherwise, and even in an old edition of "Byles on Bills" it is stated that "cheques may be post-dated." [Lord Coleridge.—The defence was set up under a strange misapprehension. Carpenter purchased a cheque drawn by Street, and as it was stopped sued the drawer. What defence is there?] Mr. Cluer, for the plaintiff, was not called upon. [Lord Coleridge.—The case is clear—the plaintiff is entitled to recover.] Appeal dismissed with costs.

BURTON GAS WORKS TAR AND LIQUOR.—The Derbyshire Chemical Company, Limited, has secured the tar from the Burton gas works at £1. 10s. per ton; and the Sharon Chemical Company has secured the ammonical liquor at from 5s. 6d. to 14s. 6d. per ton, according to strength.

ZINC ORE IN PENNSYLVANIA.—It is stated that zinc ore has been discovered on a tract of land three miles west of Bloomsburg, Pa. The land is owned by Hoffman and Miller, of Avon, and has been leased to H. A. Hecken, of Allentown, who has for years cultivated it for agricultural purposes, but which will now be discontinued and the work of opening up and developing the vein begin at once. A force of workmen are now employed making preparations for this purpose, and taking out several tons daily. It is alleged that experts pronounce it to be of good quality, and claim that the vein is of proportions which will warrant its development. The Delaware, Lackawanna and Western Railroad Company is preparing tracks for the transportation of the ore, which will be completed soon.

THE QUALITY OF SHEFFIELD GAS.—Writing over the initials "W.L.," a correspondent of the *Sheffield Daily Telegraph* says:—"As anticipated in my letter in your issue of 9th June, Mr. Jonathan Wilkinson returns the lowest official test for the month of June under the standard. What a reflection—where gas officials have all the advantages in the manufacture and distribution that money and chemical knowledge can lavish in the works, and to find the gas in June, 1890, less in value to the consumer than it was in June 1870. The gas made in Sheffield of late years, is so unstable in quality, when the heat of the sun's rays acts on the gasholders, the filthy water inside the holders is raised into a dense vapour, which blends with the gas at a high temperature; thus the volume is immensely increased. The gas, in passing from the holder to the consumers' burners, is reduced in temperature; the gaseous hydrocarbons are dropped in the most convenient places, *i.e.*, in bends and reduced apertures. The consumers get the more permanent but less illuminating gas. It is impossible to keep increasing the quantity of gas from a ton of coal without reducing its quality. I know there are gas engineers who assume, by artificial means, to pick up the gaseous hydrocarbons with the gas after it passes the ascension pipe seal from the retorts; but I have invariably found the quality of gas so treated very unstable, in fact, the device is unworthy of notice. Gas direct from the retorts under the normal conditions of coal distillation is the best under all conditions for producers and consumers."

RIVER POLLUTION AND MANUFACTURING INTERESTS.—At the fortnightly meeting of the Altrincham Union Rural Sanitary Authority, Dr. Fox, medical officer for Mid-Cheshire, submitted a report on his investigations into the pollution of streams within the Authority's district. He said there was no doubt that the subject was occupying an increased share of public consideration. In their own immediate watershed of the Mersey this consideration had been quickened and intensified by the approaching completion of the Manchester Ship Canal. He was of opinion that the construction of the canal would have a favourable effect so far as the public health was concerned. First, the sodden mud banks of the river would be to a large extent got rid of; and second, there would be only one large, enterprising, and sympathetic company to deal with. It was significant of the increased interest taken in the question that the report presented to that authority on the subject of a death from typhoid fever at Partington had received so much public attention. Since then a report had been published by the medical superintendent of the Salford fever hospital which strengthened his (Dr. Fox's) conclusions, and showed that the prevalence of scarlet fever was significantly suggestive of the wretchedly unclean condition of the river Irwell. The districts furthest removed from the river were most free from disease. It had been generally thought that the purification of rivers in congested urban and manufacturing districts was an unattainable end. If that were so, it was ridiculous and blamable to attempt it. But to what was the present foul state of our rivers due? Not to the insufficiency of means of prevention or to the impotence of labour, but to their actually having been no means of prevention instituted at all, and no consciousness of their necessity. With regard to rivers in the district, he was of opinion that the town of Macclesfield was far away the greatest offender. It seemed almost incredible that after all the representations and remonstrances that had been made by the Altrincham and other authorities this should be a sewered district without a proper outfall, sending the whole of its liquid refuse into what should be, but was not, the beautiful river Bollin. The mud at Styal was deep, black, and stinking, and from the water was wafted the subtle sickening odour of dangerous sewage gases. No indulgence should be granted to Macclesfield. Every step which the law permitted should be taken at once to correct so serious an evil and secure full compliance with the requirements of the statute. Mr. Theodore Crewdson, guardian for Styal, confirmed the Medical Officer's report, and it was decided to send copies to the Macclesfield Town Council and Board of Guardians, and demand immediate compliance with the Act.

ANILINE AS A GERMICIDE.—As it is a known fact that bacteria and bacilli absorb and are killed by aniline, it may he hoped that some simple, cheap method of applying aniline in some form may be found for purifying air, water, and other things, just as the German chemists, Stilling and Wortman, have used it with success in cases of eye and other diseases, and in surgery.

DETECTION OF PEROXIDE OF HYDROGEN.—If a few drops of solution supposed to contain peroxide of hydrogen are added to one cubic centimetre, a 10 per cent. solution of ammonium molybdate, and 1 cubic centimetre of strong sulphuric acid, a deep yellow colouration is formed if peroxide be present, having the depth of colour of the solutions of the chromates. This reaction is sufficiently delicate to detect one-tenth of a milligram of peroxide.—*M. Deniges, Comptes Rendus.*

OKONITE.—The composition of okonite is considered to be a profound secret, but a well-known analyst, to whom a piece was submitted, reports as follows:—

Rubber	49·60 per cent.
Sulphur	5·30 ,,
Lamp black	3·20 ,,
Zinc oxide	15·50 ,,
Litharge	26·30 ,,
Silica	0·10 ,,
	100·00

TAMARUGAL NITRATE CO., LTD.—The ordinary general meeting of this company was held on Friday last at Winchester-house, Old Broad-street, under the presidency Mr. F. H. Evans, M.P. In moving the adoption of the report, the chairman stated that the accounts were not as good as the directors would have liked them to be. When they invested in the company they anticipated profiits based upon a price for nitrate which, within a few months of the formation of the company, proved to be utterly fallacious. The market in nitrate collapsed at the end of the summer, and in accordance with the contracts which were named in the prospectus, it left them little out of which to realise any profit, until that period had arrived when the price practically left them no balance whatever from any sales they could make. The total output for the year had been nearly 1,500,000 quintals, compared with 1,800,000 estimated in the prospectus. Shortly after taking possession of the property they found it necessary to replace the heating pipes at La Patria, and this work had taken them practically up to now. He hoped they would receive from the vendors, who were considering the matter, a fair equivalent for the damage thus sustained by the company. The accounts showed a net profit of £81,000., and they proposed to pay an additional dividend of 2 per cent., making 12 per cent. for the past year. All engaged in the nitrate industry were hopeful of the future. The article in which they were interested had fallen to a price at which consumption had been greatly stimulated, and with the extended use of nitrate there would, no doubt, be a rise in price. The present price, however, was not a remunerative one. Mr. George Bush seconded the motion, which was adopted. An extraordinary general meeting was held subsequently. The chairman stated that it had been called to consider a proposal to reconstruct the company. The peculiar conditions of the nitrate trade, showing very large profits in one year, and very small in another, brought the element of wild speculation into the capital of the company, and the shareholders of any company subject to these fluctuations must suffer. Many suggestions had been made to the directors, but after careful consideration they had decided on the plan submitted to them, consulting, however, some of the largest shareholders, when they resolved on the division of the capital. Resolutions were submitted to the meeting, and passed, for reconstructing the company, appointing Mr. Evans the liquidator, approving an agreement between the company and Richard Kidner (on behalf of a new company to be incorporated) and authorising the winding-up to be carried out in conformity with the said agreement.

Market Reports.

REPORT ON MANURE MATERIAL.

During the week there has been a moderate business doing, at hardening prices both for phosphatic and nitrogenous material.

Cable advices from Charleston report an advance in the price of phosphate rock there, and although odd parcels of Land rock might be had at 9½d. per unit, the closing values must be considered as 10d. and 11d. per unit for Land and River rock respectively, in cargoes c.i.f. to U.K.

A sale of 70% Canadian rock has been made at 12d. per unit delivered Liverpool, but it is reported that the bulk of the Canadian production has been bonded for two months for an English syndicate,

with option of purchase outright, and it seems likely that higher prices will now be required, though U.K. buyers show no eagerness to purchase this grade of rock. Quotations for other descriptions of phosphate remain without change.

We do not hear of any business in River Plate cargoes of bones, but there are several now on the market, and £5. 10s. would probably be accepted for July shipment. There is considerable inquiry for East Indian bone meal, there being buyers at £5. 10s. Liverpool and £5. 12s. 6d. other ports, but shippers seem indisposed to commit themselves to further sales at present at any price. At the present time there are 2,300 tons afloat for the Continent and 2,000 tons for America, quantities much larger than have been hitherto shipped to these destinations. Shippers of crushed Kurrachee bones also refuse to quote at present, and it is doubtful whether £5. 5s. would be accepted if bid. There have been no further sales of common grinding bones at Liverpool, but £4. 17s. 6d. may be now considered as nearest value.

Since our last report there has been considerable excitement in the nitrate market, owing to strikes and rioting on the West Coast, and there has been large buying going on, mainly for the Continent. Conflicting reports continue to be received, but it would seem that things are settling down, the advance in wages having been conceded. Spot value is 8s. 3d. per cwt. for ordinary quality, and 8s. 4½d. for refined. Due cargoes are worth 8s. 3d., May-June sailings 8s. 4½d. to 8s. 6d., and autumn sailings 8s. 7½d. to 8s. 9d. per cwt. for ordinary quality; 3d. to 6d. more for refined.

Further sales of home prepared dried blood have been made at the equivalent of 10s. 6d. per unit f.o.r. at works, at which price there are still sellers. Nothing further reported in ground hoof or animal guano.

THE COPPER MARKET.

Messrs. Harrington & Co.'s copper report, dated Liverpool, 16th July, states:—Chili copper charters for first half of July are advised as 1,600 tons fine. The total charters since 1st January have been 13,400 tons against 13,100 tons for same time last year. Business in G.M.B.'s has continued to be good up to the last few days, when the quantities disposed of were only moderate. Prices touched £58. 5s. cash, and £59. three months, as highest, and £57. 2s. 6d. and £57. 15s. respectively as the lowest, closing to-day at £57. 15s. cash, and £58. 10s. three months. Swansea stock has been increased to 775 tons by 377 tons from Havre stock. During the past fortnight, there has been an increase of 560 tons in Liverpool, London, and Swansea stocks, but in consequence of 1,050 tons being delivered out of Havre stock, there is a decrease of 490 tons as compared with the previous fortnight. Furnace material sales have been effected at the following prices. Mexican ore, to arrive, 11s. 3d.; copper ore 11s.; copper barilla 11s. 9d.; Portuguese ore, to arrive, 10s. to 11s. 3d.; Spanish ore (15%) 10s. 9d., (8%) 9s. 6d., to arrive; Portuguese, precipitate, to arrive, at 11s. 9d.; Carpio precipitate 11s. 10½d.; ordinary Anaconda matte (re-sale) 11s. 6d. per unit.

MISCELLANEOUS CHEMICAL MARKET.

We have to report a strong market in chemicals generally, and business during the week very good. Bleaching powder is in fairly good demand, and prices have advanced 10s. to 15s. per ton. We have experienced considerable enquiry for 1891 delivery, but in face of present negotiations makers as a rule decline to quote. Caustic soda is exceptionally strong and difficult to obtain, either for prompt or forward delivery. Owing to the heavy demand, most stocks are cleared. We quote 70% white £9. 15s., 60% white £8. 15s., 60% cream £7. 15s., all rails at makers' works. Soda ash is firmer and in good request, prices rather higher. Saltcake not so plentiful, and advanced—present value 30s. at works. Soda crystals rather quiet, and unchanged. Chlorate of potash has slightly declined, and business passing is not important; we quote 4¾d. per lb. Soda, 6d. per lb. Sulphate of copper remains dull, and prices (in face of a firmer metal market) are decidedly weaker. Business has been done at very low figures; £20. per ton may be taken as its full value to-day. Lead salts continue very steady, and business on the whole is better, but prices do not improve. Ammonia and its salts more enquired after at former prices, viz: carbonate 3¾d., liquid, 880°, 3d. Sulphocyanides of ammonium and barium firmer; we quote ammonium ¼d., barium 5½d. Carbolic acids steady, and prices all round are firmer.

TAR AND AMMONIA PRODUCTS.

The benzol market has undergone, practically, no change, and last week's prices may be quoted as to-day's. The same remark applies to most of the other tar products, with the exception of crystallized carbolic, which has gone up from 7½d. to 8d. per lb.

Sulphate of ammonia is a shade easier at Leith and Hull, the prices at these ports being £11. 5s. and £11. 6s. 3d. respectively. Some large sales have been effected from the former place, and to this fact the slight drop is probably due. The Beckton price is nominally £11. 12s. 6d., and outside London makes are fetching £11. 8s. 9d.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Iron warrants are firmer, 45s. 10½d. cash to 46s. 1d. one month being to-day's price for Scotch pig. Middlesbrough, 43s. cash. Hematite, 52s. 2d. cash. Copper continues firm and in good demand, G.O.B.'s and G.M.B.'s closing at £57. 15s. to £58. 2s. 6d. cash, and £58. 10s. to £58. 17s. 6d., three months. Sulphate of copper in slightly better demand. Tin, foreign, was very firm and cash dearer at £96. for Straits, £96. 7s. 6d. for Australian, £99. to £99. 10s. for English, and £82. to £92. for Peruvian, according to quality. Lead market quiet at £12. 17s. 6d. for Spanish, and £13. 2s. 6d. to £13. 5s. for English. Spelter, Silesian ordinary, £22. 10s. to £23. Quicksilver, £10. 3s., second hands. Silver rose to 50d. and closes 50¼d. In copper shares, Rio Tinto fell 1/16 to 22 13/16; but Cape and Tharsis rose ⅛ each to 4 13/16 and 5¼, and Panulcillo 1/16 to 1 5/16.

GLASGOW, WEDNESDAY.—Market firm, with a fair business. Scotch done at 45s. 9½d., 45s. 11d., 45s. 9½d., and 45s. 10½d. cash, also at 46s., 46s. 1d., 45s. 11d., and 46s. 0½d. one month; closing buyers at 45s. 10d. cash, sellers ask ½d. more. Middlesbrough done at 43s. cash; closing buyers at 43s. cash, sellers ask 43s. 1½d. Hematite done at 52s. 1d. cash, also at 52s. 2d. to 52s. 4½d. one month; closing buyers at 52s. 1½d. cash, sellers ask 52s. 2½d.

WOLVERHAMPTON, WEDNESDAY.—There was a better tone on 'Change this afternoon, and the opinion was expressed that a gradual improvement is setting in. Cold-blast all-mine pigs have been reduced 5s., making them £5. Hot-air all-mine pigs range from 62s. 6d. to 70s. Northampton and Derbyshire sorts in better demand at 47s. 6d. and 50s. Staffordshire cinder sorts are quoted 40s. Galvanised sheets are quoted £12. 10s. and £13. for doubles, and marked bars £8. 10s. Hoops, £7. 10s.

THE LIVERPOOL MINERAL MARKET.

A fair amount of business has been done during the week, and prices have been maintained. Manganese: Arrivals have somewhat improved. The most of them, however, have gone into consumption and prices remain unchanged. Magnesite continues to offer freely and can be bought at almost any price. Raw lump, 26s., raw ground, £6. 10s., and calcined ground £10. to £11. Bauxite (Irish Hill brand): There has been a big run on this article, and large shipments have been made, whilst prices are very strong—Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: Arrivals this week have been very small. The demand has been well maintained, and prices remain firm, especially for G.G.B. "Angel White" brand, 95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate): Whilst there is an improved demand, the output has kept pace with it, and prices are unchanged; selected crystal lump is scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; and selected crystal ground, £8. Sulphate firm, and prices are better; best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.G.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumice-stone somewhat quieter; ground at £10., and specially selected lump, finest quality, £13. Iron ore steady. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore quiet. Spanish manganiferous ore in fair demand. Emerystone: Best qualities in demand at full prices. No. 1 lump is quoted £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable

ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal continue in fair demand. Chrome metal, 5s. 6d. per lb. Chrome ore offering best qualities freely, and prices easier. Antimony oxide, 24s. to 26s. Asbestos is in strong demand, especially rock; prices firmer. Potter's lead ore continues firm; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Best qualities are scarce—60s. to 80s. Strontia steady; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Bog ore in demand, firm, at 22s. to 25s. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, continues scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel easier. Chrome iron unaltered at last quotations. Ground mica, £50. China clay freely offering—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn).

THE LIVERPOOL COLOUR MARKET.

Colours in demand, prices unaltered. Ochres: Oxfordshire quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc: V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market continues steady and prices all round are higher than last week. Bleaching powder for prompt shipment is unchanged, but for delivery to end of September prices have been advanced five to ten shillings per ton. Caustic soda, both solid and ground, is ten shillings per ton dearer. Soda crystals have been advanced eighteen pence per ton, and the discount on soda ash reduced by two-and-a-half per cent. Market to-day closes firm all round.

Current quotations are as follows:—Bleaching powder, in softwood casks, prompt delivery, £5. 5s. per ton; August-September, £5. 10s. to £6. per ton; caustic soda, 77%, £10. 10s. per ton; ground and packed in 3-4 cwt. barrels, £13. 10s. per ton; soda ash, 48/52%, 1¼d. per degree, less 2½%; soda crystals, £2. 12s. 6d. per ton, in casks, gross weight; £2. 15s. per ton, in 1 cwt. bags, net weight; £2. 12s. 6d. per ton, in 2 cwt. bags, net weight; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £5. 15s. per ton; in 5-7 cwt. casks. £5. 5s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

There is hardly any change to report in the price of small coals for manufacturing purposes. Durham small is firm at about 7s. 6d. per ton, and Northumberland steam small easy at 6s. to 7s. per ton, according to quality.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The general market is very strong, and prices for the most part are advancing, the stimulant consisting largely in the prospect of the Chemical Union being realised, which some hold to be assured, although on the other hand there is a sturdy scepticism afoot also. The inflation is therefore rather artificial in character. Bleaching powder has perhaps felt the influence most, as the article standing most in need of it, and its rally has been quite marked, the advance for the week being fully 5s. Caustic sodas also have risen 5s. to 15s., according to strength, and now fetch the highest prices of the past quarter. Articles receding in spite of the general "boom" are sulphate of copper, paraffin oil (burning), and sulphate of ammonia. The latter has been very strong in this market, and last week quite £11. 10s. was got, but the edge is off the advance, and to-day £11. 7s. 6d. is obtained with difficulty. In one case a holder has been offering to sell for less, but the buying section seems not at all in a hurry, thinking perhaps that there will be no further rally at present. All paraffin products (except burning oil) are strong, particularly scale and wax. Chief prices current are:— Soda crystals, 52s. 6d., net Tyne; alum in lump £5., less 2½% Glasgow; borax, English refined, £29. 10s, and boracic acid, £37. 10s., net Glasgow; soda ash, 1¼d. less 2½%, Tyne; caustic soda, white, 76°, £11., 70/72°, £9. 15s., 60/62°, £8. 15s., and cream, 60/62°, £7. 15s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s, and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1½d., less 1¼%, Tyne; saltcake, 26s. to 28s.; bleaching powder, £5. 5s. to £5. 12s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5 and 6% to Scotch and English buyers respectively (for export these prices net); chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 3d. to 8s. 4½d.; sulphate of ammonia, £11. 6s. 3d. to £11. 7s. 6d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £19. 10s., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3¼d.; paraffin spirit (naphtha), 7d. a gallon; paraffin oil (burning), 6¾d. to 7d. on rails Glasgow to all Scotch buyers (English orders negotiable about 1¼d. a gallon lower); ditto (lubricating), 865°, £5. to £5. 10s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's import of sugar at Greenock were 16,131 bags.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Manufacture of Minium—(Complete Specification). M. Alsberg. 10,130. July 1.
Preserving Organic Fluids. T. Sheppard and W. Sheppard. 10,144. July 1.
Charging and Drawing Gas Retorts. J. Ruscoe. 10,155. July 1.
Treatment of Sewage. F. W. Shorey and C. R. Hudson. 10,157. July 1.
Manufacture of Extract of Malt. F. X. Kleinpeter. 10,160. July 1.
Injectors. R. G. Brooke. 10,164.
Refrigerating Machinery—(Complete Specification). H. von Bayer. 10,172. July 1.
Manufacture of Soap. J. N. Zeittler. 10,173. July 1.
Refractory Compounds. J. B. Torres. 10,175. July 1.
Secondary Batteries—(Complete Specification). T. M. Foote. 10,181. July 1.
Production of Alkaline Carbonates from Sulphates. O. Imray. 10,194. July 1.
Coal Sorting Machinery. H. Stevenson. 10,222. July 2.
Steam Generators. W. Chambers. 10 228. July 2.
Treatment of Sewage by Zinc and Electricity. A. Green. 10,229. July 2.
Mono-Sulpho Acid of Alpha-Naphthol. Read, Holliday, and Sons, Limited, and P. R. E. Deidler. 10,237. July 2.
Manufacture of Azo Colours. Read, Holliday, & Sons, Limited, and P. R. E. Deidler. 10,240. July 2.
Ore Mills. J. P. Bayley. 10,249. July 2.
Removing Grease from Textile Fabrics. T. J. Hutchinson. 10,285. July 3.
Mechanical Stokers and Furnace Bars. A. Bell. 10,290. July 3.
Abstracting Ammoniacal and other Gases from their Saturated Solutions. C. Stuart. 10.293. July 3.
Mechanical Stokers. J. Proctor. 10,300. July 3.
Carbonic Acid Cartridges. P. Giffard. 10,308. July 3
Treatment of Town Refuse. F. Scudder. 10,313. July 3.
Manufacture of Matches. A. J. Boult. 10,321. July 3
Scouring Textile Fabrics. W. Hutchinson. 10,323. July 3.
Treatment of Cloth with Bleaching and other Liquors. W. Hutchinson 10,324. July 3.
Manufacture of Gas. J Love. 10,329. July 3.
Manufacture of Sugar. A. Lefranc and A. Vivian. 10,331. July 3.
Manufacture of Blood Albumen. A. S. F. Grünbaum and T. B. Wood. 10,337. July 3.
Apparatus for Condensing and Liquefying Gases. J Gamgee. 10,374. July 3.
Apparatus for Distilling Sea Water. J. Gilmore. 10,379. July 3.
Pyrometers. J. Murrie 10,380. July 4.
Heaters—(Complete Specification) E B. Woolston. 10,384. July 4.
Bleaching and Scouring Machinery. F. A. Blair. July 5.
Apparatus for Salt Crystallization. J. Barlow and H. T. Everist, July 5.
Calcining Carbonaceous Minerals for Cement. W. Darling. 10,427. July 5.
Salicylicate of Phenyldimethylpyrazolone. H. Luttke, L. Scholvien, and L. F. Riedel. 10,432. July 5.
Distilling Apparatus. W. P. Thompson. 19,436. July 5.
Cement Clinker Disintegrators. W. G. Margetts. 10,437. July 5.
Azo Colouring Matters. Brooke, Simpson, and Spiller, Limited, and A. G. Green. 10,448. July 5.
Manufacture of Saccharate of Lime. W. R. Hutton. 10,449. July 5.
Recovery of Ammonia from Sewage Sludge. C. J. Moore. 10 451. July 5.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

W. R. Todd, W. A Todd, W. G. Robins, and W. J. Wharam, under the style of W. R. Todd & Son, Kingston-upon-Hull, paint, colour, and varnish manufacturers and merchants, as far as regards W. R. Todd, deceased, and W. J. Wharam.

Hodgkinsons, Treacher & Clarke, Upper Whitecross St., St. Luke's, London, chemists.

J. Macfarline and L. N. Freke, under the style of J. Nestor & Co., George St. Mansion House, London, E.C., purchase and sale of anthracite coal.

C. J. Hitchcock and E. L. Hitchcock, under the style of Hitchcock & Sons, Oxford, chemists.

New Companies.

Antonio (Bilbao) Iron Ore Company, Limited.—This company was registered on the 9th inst., with a capital of £40,000., in £1. shares, to purchase from G. B. Stirrup, upon terms of an unregistered agreement of 2nd inst., estate and interest in the Antonio (Bilbao) Mine, and the San Andres (Bilbao) Mine situate in the district of San Julian de Musques, in Spain. The subscribers are :—

	Shares.
G. R. Mostyn, Newport, Mon., merchant	1,000
J. A. Kilman, Winchester-house, solicitor	1
A. E Cossor, 12, Castle-road, Kentish-town	1
A P. Fillene, Newport. Mon., merchant	1,000
C E. Parsons, C.A., Newport, Mon.	1,000
A. W. Skillman, 22, Uxbridge-road, W.	1
E. F. Cossor, 12. Castle-road, N.W	1

W. Singleton, Birch, and Sons, Limited.—This company was registered on the 3rd inst., with a capital of £100,000., divided into 10,000 5 per cent. preference, and 10,000 ordinary shares of £5. each, to take over the business of an existing company of the same title, trading at Upton-street, Manchester, as mineral merchants, producers of china clays, manufacturers of whitings, chalks, cements, and the like. The subscribers are :—

	Shares.
C. H. Gillibrand, Bowdon, Cheshire, manufacturer	1
G Platt, Moss Side, Manchester, cashier	1
J. R. Straus, junr., 45, Portland-street, Manchester merchant	1
H. F. Herford, Buxton	1
J. R. Straus, 18, Grafton-street, Manchester, merchant	1
W. S. Barrett, 41, Old Hall-street, Liverpool, colliery owner	1
T. E. Sampson, 13, Harrington-street, Liverpool, solicitor	1

IMPORTS OF CHEMICAL PRODUCTS AT THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending July 5th.

Acetate of Lime—
U. S., 380 bgs. Johnson & Hooper

Acetic Acid—
Holland, 50 pks. A. & M Zimmermann
U. S., 3 W. E. Bott & Co
Holland, 34 Phillipps & Graves

Antimony Ore—
Portugal, 10 t. H. Emanuel
France, 21 Pillow, Jones & Co.
Salonica, 20 H. R. Merton

Barytes—
Germany, 61 pks. T. & Farmiloe
,, 22 W. Harrison & Co.
,, 4 H. Lambert
Belgium, 23 C. J. Capes & Co.
Germany, 31 cks. W. Harrison & Co.
,, 23 O'Hara & Hoar
Holland, 66 O. Boltz
Germany, 23 Constable, Henderson & Co.
,, 19 J. A. Drew

Borax—
Germany, £26 F. Stahlschmidt & Co.

Boracic Acid—
Italy, 20 pks. J. Puddy & Co

Bones—
Teneriffe's 7 t. Swanson & Co.
Gibraltar, 12 Goad, Rigg & Co.

Brimstone—
Italy, 80 t. B. Jacob & Sons
,, 5 B. Boor & Co.
,, 20 C. Vincent
,, 10 Prop. Scott's Wf.
,, 105 Johnson & Hooper
,, 20 J. Kitchen, Ltd.
,, 1,335 G. Boor & Co.
,, 218 W. C. Bacon & Co.
,, £35 J. Kitchin, Ltd.

Copper Ore—
Portugal, 5 t. L. & I. Jt. Co

Cream of Tartar—
France, 2 pks. E. W. Carlington
Italy, 10 L. & I. D. Jt. Co.
,, 20 W. C. Bacon & Co.
France, 11 Allan Bros. & Co.
Italy, 10 L. & I. D. Jt. Co.
,, 30 B. & F. Wf. Co., Ltd.
France, 5 ,, ,,
,, 10 G. F. Gerhardt
Italy, 42 B. Jacob & Sons

Caoutchouc—
Zanzibar, 11 c. Clarke & Smith
,, 43 L. & I. D. Jt. Co.
U. S., 18 Kebbel, Son & Co.
Zanzibar, 15 Beresford & Co
Germany, 15 Kebbel, Son & Co.

Chemicals *(otherwise undescribed)*
Germany, £9 T. H. Lee
,, 70 Petri Bros.
France, 154 Charles & Fox

Chemicals—*continued*
Germany, 5 L. & I. D. Jt. Co.
,, 25 Phillips & Graves
,, 570 A & M. Zimmermann
,, 40 L. & I. D. Jt. Co.
,, 5 Burgoyne, Burbidge & Co.
,, 5 Phillipps & Graves
,, 8 Kaul & Haenlein
,, 64 A. & M. Zimmermann
France, 12 H. Lorenz
Germany, 400 A. & M. Zimmermann

Dyestuffs—
Indigo
E. Indies, 19 chts. Patry & Pasteur
Germany, 1 Melchers, Runge & Co.
Austria, 9 L. & I. D. Jt. Co.
Italy, 8 ,, ,,
E. Indies, 18 H. Johnson & Sons
,, 20 F. Stahlschmidt & Co.
Argols
Italy, 835 pks. B. Jacob & Sons
France, 11 N. S. S. Co., Ltd.
Italy, 847 B. Jacob & Sons
Madders
Holland, 8 pks. J. Barber & Co.
Myrabolams
E. Indies, 590 bgs. Leach & Co.
Italy, 667 Soundy & Son
Tanners' Bark
Holland, 51 t. J. Graves
Adelaide, 70 Devitt & Hett
Melbourne, 40 Beresford & Co.
,, 90 Baxter & Hoare
,, 23 Leach & Co.
Holland, 11 Sawer, Mead & Co.
,, 11 ,, ,,
Melbourne, 68 Union L. Co., Ltd.
Turmeric
Cochin, 70 pks. Anderson, Weber & Smith
Sumac
Italy, 100 pks. F. Roberts
,, 700 W. Shelcott
,, 350 Anderson Anderson & Co.
,, 266 L. & N. W. Rly. Co.
,, 500 Brown & Elmslie
France, 20 Arnati & Harrison
Valonia
Smyrna, 9 t. Anning & Cobb
,, 50 Boutcher, Mortimore & Co.
,, 20 Hicks, Nash & Co.
Italy, 5 Adam Bros.
Extracts
Denmark, 6 pks. Fullwood & Bland
,, 122 J. Forsey
Gambier
Singapore, 209 pks. L. & I. D. Jt. Co.
,, 109 ,, ,,
,, 431
Annatto
E. Indies, 2 pks. Hoare, Wilson & Co.

Dyestuffs *(otherwise undescribed)*
Holland, 42 pks. Burt, Boulton & Co.
Melbourne, 1,215 bgs. Baxter & Hoare

Glucose—
Germany, 25 pks. 220 cwts. Union Lighterage Co. Ltd.
U. S., 200 1,200 Props. Scott's Whf.
,, 127 740 Horne & Co.
Germany, 20 20 T. H. Lee
,, 50 460 L. & I. D. Jt. Co.
U. S., 50 280 Union Lighterage Co.
Germany, 12 90 J. Cooper
,, 25 200 T. M. Duche & Sons
,, 23 196 Dutrulle, Solomon & Co.
,, 450 874 L. & I. D. Jt. Co
,, 1,000 1,000 R. D. Drummond & Co.
,, 400 400 Baxter & Hoare
,, 25 200 T. M. Duche & Sons
,, 145 365 Props. Chmbln's Wf

Glycerine—
Holland, £66 Knight & Morris
,, 240 Spies, Bros. & Co.
France, 60 B. & N. Wvs. Co., Ltd.
Germany, £45 A. & M. Zimmermann

Isinglass—
E. Indies, 16 pks. Clarke & Smith
,, 17 Rehder & Co.
Demerara, 2 W. M. Smith & Sons
E. Indies, 6 Rehder & Co.
N. Russia, 6 M. D. Co.

Iron Oxide—
Sydney, £30 McLean Bros. & Co.

Manure—
Holland, 100 t. H. & E. Albert
Germany, 50 t. Perkins & Homer
France, 110 T Farmer & Co
,, 350 T. Burnett & Sons
,, 133 Lawes Manure Co., Ltd.
,, 32 G. Bennett & Sons
Holland, 130 A. Hunter & Co.
Germany, 50 Adley, Tolkin & Co.
Phosphate Rock
France, 150 t. Wyllie & Gordon

Manganese Ore—
New Zealand, 139 t. W. A. Sparrow

Naphtha—
Holland, 107 pks. Lister & Biggs
,, 8 drs. ,, ,,

Nitre—
Germany, 17 cks. Craven & Co

Potassium Carbonate—
France, 11 pks. J. A. Reid
Germany, 19 Beresford & Co.

Pyrites—
Spain, 350 t. F. C. Hills & Co.
,, 2,989 C. Tennant, Sons & Co.

Potassium Bicarbonate—
Holland, £70 A. & M. Zimmermann

Potash—
Montreal, 35 pks. J. Barber & Co.
Germany, £40 M. D. Co

Potashes—
Montreal, 50 c. S. Ward & Co.
,, 90 ,, ,,

Pearl Ashes—
France, 60 c. Petri Bros
Montreal, 50 S. Ward & Co.

Paraffin Wax—
U. S., 98 brls. H. Hills & Sons
,, 90 J H. Usmar & Co
,, 100 G. H. Frank

Plumbago—
Germany, 5 cks. E. & G. Hirsch & Co.
,, 14 Brown & Elmslie
,, 17 Prop. Scott's Wf.
,, 34 ,, ,,
,, 19 Brown & Elmslie

Stearine—
France, 200 bgs. G. Boor & Co
Holland, 54 H. Hill & Sons
France, 120 ,, ,,
U. S., 20 hds. J. Goddard

Saltpetre—
Germany, 17 cks. Craven & Co.
,, 72 J. Hall & Co

Tartaric Acid—
Holland, 23 pks. B. & F. Wf. Co. Ltd.
France, 32 ,, ,,
,, 8 C. Christopherson & Co.
,, 8 G. R. Gerhardt
,, 3 Dutrulle Solomons & Co.
,, 4 Augspurg. Hopf & Co.

Tar—
Pillan. 200 brls. Linck, Moeller & Co.

Ultramarine—
Holland, 5 cs. Phillipps & Graves
,, 4 cks. Ohlenschlager Bros.
,, 6 cs. Phillips & Graves
Belgium, 8 cks. H. Kohnstann
,, 5 pks. W. Harrison & Co.

Zinc Oxide—
Holland, 54 brls.

LIVERPOOL.

Week ending July 8th.

Acetate of Lime—
New York, 883 bgs.
,, 223

Acetic Acid—
Rotterdam, 53 botls.

Antimony—
Havre, 1 cs.

Albumen—
Ghent, 7 cs. J. T. Fletcher & Co.

Bones—
Alexandria, 74½ t.
Ceara. 1,000 bgs.
Tripoli, 285 4
New York, 322
Smyrna, 153

Bone Ash—
Rio Grande du Sol, 300 t. J. Gordon & Co

Caustic Potash—
Dunkirk, 21 dms.
Copper Sulphate—
Venice, 18 brls.
Cream of Tartar—
Barcelona, 2 btls. 2 hds.
Caoutchouc—
Ceara, 7 bls. Leech Harrison & Co.
New York, 21 bgs.
Akassa, 815 Royal Niger Co.
Bageida, 2 brls. 2 cs. F.&A. Swanzy
Lome, 5 cks. 6 1 F & A Swanzy
Quittah, 2 8 3 F. & A. Swanzy
,, 3 Rayner & Co.
Accra, 5 2 Rayner & Co
,, 4 Pickering & Berthoud
,, 1 W. D. Doodin
,, 4 1 Davies, Robbins & Co.
,, 27 3 J. P. Werner
,, 9 Fischer & Co.
,, 1 1 5 F.&A. Swanzy
Pram Pram, 1 Fischer & Co.
Appam, 1
Salt Pond 11 2 Miller Bros.
,, 1 6 J. Stadelman
,, 11 5 Pickering & Berthoud.
,, 2 A.Reis
,, 2 McIver & Co.
,, 5 Millerson & Co.
,, 1 Havard & Co.
,, 7 Radcliffe & Durant
,, 5 2
C. C Castle, 1 cs. 12 brls. Davies, Robbins & Co.
,, 5 C. L. Clare & Co.
,, 1 6 Millerson & Co
,, 1 1 Pickering & Berthoud
,, 3 Challenor & Co.
,, 3 Ellis & Co.
,, 19 Miller Bros
,, 2 Taylor, Laughland & Co.
,, 5 C. Freece
,, 1 14 Fletcher & Fraser
,, 1 3 J. Smith
,, 1 8 McIver & Co.
,, 2 4 Mordaunt Bros
,, 6 1 Grimwade Ridley & Co.
,, 1 Tomlinson & Co
,, 5 Hart & Co.
,, 2 4 W. D. Woodin
,, 3 H. B. W. Russell
,, 1 Edwards Bros.
Elimina, 2 A. Reis
Dixcove, 1 2 Pickering & Berthoud
,, 1 Tomlinson & Co.
,, 1 H. B. W. Russell
,, 1 Edwards Bros.
Axim, 3 bgs. ,,
,, 2 Lintott Bros & Co.
,, 1 Havard & Co.
Assinel, 1 Millward, Bradbury & Co.
,, 1 A. Verdier.
,, 1 Waite & Co.
,, 1 F. & A Swanzy
,, 1 cs. Edwards Bros.
,, 1 Eaton & Son
Gd. Bassam, 4 cks. F. & A Swanzy
,, 2 Millward, Bradbury & Co.
,, 6 bgs. 4 brls. Edwards Bros.
,, 2 M. C Bank
,, 1 M. Redyard
,, 2 Oppenheimer & Co.
,, 3 E. Wayland
,, 2 Pickering & Berthoud
,, 9 W. D. Woodin
,, 1 Tomlinson & Co.
Monrovia, 1 brl.
Sierra Leone 27 Pickering & Berthoud
,, 3 cks. Paterson Zachonis & Co.
,, 7 French & Co.
,, 38 7

Chemicals *(otherwise undescribed)*
Dunkirk, 1 csd. botl.
Rotterdam, 7 cks.
Dyestuffs—
Extracts
Hamburg, 5 cks. 50 cs. J.T.Fletcher & Co.
,, 5
Divi Divi
New York, 331 bgs. W. Clucas
Sumac
Catania, 20 bls.
Palermo, 400 bgs.
,, 100 J. Kitchen, Ltd.
Fustic
Colon, 50 t. A Dobell & Co.
Valonia
Constantinople, 1 bg.
Smyrna, 253 t.
Myrabolams
Bombay, 630 Forbes, Forbes & Co.
,, 2,145 D. Sassoon & Co.
Argols
Oporto, 23 cks. Cotesworth Lyne & Co.
Madders
Constantinople 50 bls.
Smyrna, 18
Rotterdam, 3 cks.
Alizarine
Rotterdam, 1 bx. 12 brls.
,, 23
Dried Blood—
Ghent, 49 bgs.
Glucose—
Dunkirk, 80 bgs
Hamburg, 20 60 drs.
Glycerine—
Hamburg, 8 cs. 2 crbys.
Bordeaux, 12 cks.
Horn Piths—
Rio Grande du Sol, 3 t. J. Gordon & Co.
Manganese Ore—
Gothenburg, 200 t. Macqueen Bros.
Poti, 2,200 ,,
Oxalic Acid—
Rotterdam, 8 cks
Pitch—
Rotterdam, 66 cks.
Potash—
Rotterdam, 2 cks.
Phosphate—
Montreal, 210 t. Phosphate Lime Co.
Salt—
Calcutta, 1 bg.
Sodium Acetate—
Hamburg, 9 cks. J. T. Fletcher & Co.
Sodium Bicarbonate—
Hamburg, 3 cks.
Stearine—
Hamburg. 12 bgs.
Sodium Phosphate—
Rotterdam, 6 cks.
Soda—
Rotterdam, 25 brls. 100 kgs.
Saltpetre—
Hamburg, 51 cks.
Calcutta, 559 bgs.
Sodium Nitrate—
Pisagua, 13,475 bgs. Paccha & Joz. Nit. Co.
Tar—
Marseilles, 141 cks. J. R. Pearce & Co.
Tartar—
Bordeaux, 4 cks.
Tartaric Acid—
Rotterdam, 15 kgs. 6 cks.
,, 8
Ultramarine—
Hamburg, 12 cs.
Rotterdam, 14 40 brls.
Zinc Oxide—
Hamburg, 25 cks. 152 brls.
Zinc Ashes—
Boston, 10 brls.

GOOLE.

Week ending July 2nd.

Alum—
Rotterdam, 8 cks.
Antimony Sulphide—
Boulogne, 1 ck.
Antimony Ore—
Boulogne, 2 cks.
Caoutchouc—
Boulogne, 13 cks.
,, 1
Chemicals *(otherwise undescribed)*
Rotterdam, 1 ck.
Dyestuffs—
Alizarine
Rotterdam, 18 pks.
,, 29 cks.
Extracts
Rotterdam, 1 cs.
Rouen, 50 cks.
Logwood
Yucatan, 500 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 54 cks. 4 cs
Dextrine—
Delfziel, 20 cks.
Glucose—
Hamburg, 20 cks.
,, 9
Calais, 100 bgs.
Potassium Muriate—
Rotterdam, 18 cks.
Phosphate—
Ghent, 800 bgs.
Potassium Carbonate—
Calais, 20 brls.
Sodium Silicate—
Rotterdam, 8 cks.
Saltpetre—
Rotterdam, 70 bgs.
Hamburg, 12 cks.
Ultramarine—
Rotterdam, 4 cks.
Waste Salt—
Hamburg, 513 bgs.

GLASGOW.

Week ending July 10th.

Chemicals *(otherwise undescribed)*
Antwerp, 1,310 pks. 93 kgs.
Copper Ore—
Huelva, 1,820 t. Tharsis Co.
Cobalt Ore—
Antwerp. 10 t. 3 bgs.
Dyestuffs—
Alizarine
Rotterdam, 128 cks.
,, 35
Glucose—
New York, 200 brls.
,, 109
Gutta Percha—
Rotterdam, 25 bkts.
Pyrites—
Lisbon, 1,683 tcs. Tharsis Co.
Pitch—
Antwerp, 12 cks.
Stearine—
Antwerp, 63 bgs.
,, 4 brls.
Tartaric Acid—
Rotterdam, 1 ck. J. Rankine & Son
Tar—
Archangel, 4,100 brls. Gourock Ropework Co.
,, 492
Ultramarine—
Rotterdam, 11 cs. 1 ck. J. Rankine & Son
Zinc Oxide—
Antwerp, 100 brls.

TYNE.

Week ending July 9th.

Acetic Acid—
Rotterdam, 80 crbys. Tyne S. S. Co
,, 10 ,,
Alum Earth—
Hamburg, 18 cks. ,,
Chemicals *(otherwise undescribed)*
Hamburg, 1 cs. Tyne S. S. Co
Copper Oxide—
Hamburg, 2 cks. ,,
Glucose—
Hamburg, 60 bgs. ,,
Phosphate—
Antwerp, 300 t. Langdales Chml. Co.
Paraffin Wax—
New York, 160 brls. Chr. Furness
Saltpetre—
Hamburg, 260 t.
,, 7 cks. Tyne S. S. Co.
Waste Salt—
Harburg, 250 t. Clephams & Wiencke

HULL.

Week ending June 16th.

Acetic Acid—
Rotterdam, 24 pks. Hutchinson & Son
Acids *(otherwise undescribed)*
Rotterdam, 8 cks. G. Lawson & Sons
Barytes—
Rotterdam, 22 cks. Hutchinson & Son
Antwerp, 21 H. F. Pudsey
Brémen, 22 T W. Flint & Co.
,, 13 H. T. Greaves & Co.
,, 23 Tudor & Sons
Chemicals *(otherwise undescribed)*
Dunkirk, 1 cs. 40 cks. Wilson, Sons, & Co.
Hamburg, 2 pks. ,,
Antwerp, 43 ,,
Bremen, 2 cs. J. Pyefinch & Co.
Antwerp, 27 cks. Wilson, Sons, & Co.
Dyestuffs—
Myrabolams
Antwerp, 390 bgs. Dawson Bros.
Bombay, 2,313
Madders
Rotterdam, 5 cks G. Lawson & Sons
Alizarine
Rotterdam, 15 cks. Hutchinson & Son
,, 17 W. & C. L. Ringrose
,, 26 brls. G. Lawson & Sons
,, 31 pks. Hutchinson & Son
Rennet
Rotterdam, 1 ck. W. & C. L. Ringrose
Copenhagen, 3 Wilson, Sons, & Co.
Dyestuffs *(otherwise undescribed)*
Hamburg, 22 pks. Wilson, Sons, & Co.
Glycerine—
Hamburg, 1 drum
Glucose—
Hamburg, 21 cks. Wilson, Sons, & Co.
,, 10 Rawson & Robinson
Rotterdam, 20 bgs. W. Jackson & Son
Stettin, 6 cks. Wilson, Sons, & Co.
,, 800 bgs. C. M. Lofthouse & Co.
,, 600
Horn Piths—
Dunkirk, 6 t. Wilson, Sons, & Co.
Isinglass—
Hamburg, 1 cs. ,,
Oxide—
Rotterdam, 15 cs. Huthhinson & Son
Pyrites—
Huelva, 850 t. J. Dalton, Holmes, & Co.
Pitch—
Rotterdam, 44 brls. G. Lawson & Sons
Phosphorus—
Rouen, 10 cs. Rawson & Robinson
Phosphate—
Ghent, 160 t. Wilson, Sons, & Co.
Stearine—
Rotterdam, 127 bgs.
Soda—
Rotterdam, 1 ck. G. Lawson & Sons
Saltpetre—
Hamburg, 10 cks. Bailey & Leetham
,, 10 kgs. C. M Lofthouse & Co.
,, 8 brls.
Turpentine—
Libau, 198 brls.
Ultramarine—
Rotterdam, 2 cks. G. Lawson & Sons
,, 4 W. & C. L. Ringrose
,, 2 Aire & Calder N. Co.
Zinc Oxide—
Hamburg, 25 cks.
Rotterdam, 25

GRIMSBY.

Week ending July 5th.

Chemicals *(otherwise undescribed)*
Hamburg, 5 pks.
,, 13
Antwerp, 1 ck.
Dyestuffs *(otherwise undescribed)*
Antwerp, 8 pks.
Glucose—
Hamburg, 12 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending July 2nd.

Anthracene—
Dusseldorf, 106 cks. £1,030
Ammonium Sulphate—
Hamburg, 49 t. 8 c. £450
Cologne, 13 10 152
Rotterdam, 30 327
Hamburg, 151 16 1,800
Barbadoes, 100 1,215
Hamburg, 10 4 115
Barbadoes, 30 360
Marseilles, 101 17 1,150
Alkali—
Brisbane, 30 t. 1 c. £200
Ammonium Muriate—
Melbourne, 1 t. 3 c. £30
Ammonium Carbonate—
Montreal, 9 pks. £50
St. Petersburg, 120 286
New York, 100 512
Dunkirk, 2 t. 59
Hamburg, 2 10 c. 76
Bordeaux, 15 cks. 55
Albumen—
New York, 5 t. £100
Bisulphate of Lime—
Bombay, 2 t. 12 c. £26
Copper Sulphate—
Bordeaux, 6 t. 2 c. £127
Carbon Bisulphide—
Rotterdam, 3 t. 17 c. £47
New Orleans, 8 drs. 43
Cape Town, 38 t. 17 c. £515
Citric Acid—
Oporto, 5½ c. £34
Hamburg, 2 kegs. 15
Melbourne, 1 t. 150
Constantinople, 4 c. 32
Hamburg, 15 kgs. 100
Lisbon, 6 38
Amsterdam, 5 35
Rotterdam, 2 15
Sebastopol, 2 16
Gothenburg, 1 7
Caustic Soda—
Algoa Bay, 10 c. £30
Carbolic Acid—
Rotterdam, 2 t. 5 c. £170
Carbolic Solid—
Marseilles, 21 t. 2 c. £1,654
Paris, 2 4 130
Cream of Tartar—
Brisbane, 5 c. £28
Auckland, 1 t. 104
Coal Products—
Pitch
Alexandria, 200 brls. £60
Hong Kong, 50 56
Havre, 373 t. 500
Malta, 50 15
Tar
Danzic, 950 brls. £475
Gothenburg, 250 rlls. 165
Naphthaline
Marseilles, 26 cks. £20
Treport, 67 lgs. 38
Hamburg, 56 cks. 91
Marseilles, 12 10
New York, 114 131
Benzole
Terneuzen, 32 drs. £652
Rotterdam, 20 pns. 391
,, 16 cks. 269
Antwerp, 20 pns. 400
Hamburg, 20 drs. 334
Rotterdam, 49 906
,, 20 pns. 335
Naphtha
Natal, 16 drs. £10
Treport, 26 cks. 70
Rotterdam, 24 rns. 110
Anthracene
Rotterdam, 130 cks. £698
Dusseldorf, 252 2,296
Creosote
Stettin, 10 brls. £4
Rotterdam, 15 cs. 150
Aniline Oil
Rotterdam, 10 drs. £400
Chemicals *(otherwise undescribed)*
Calcutta, 22 cs. £63
Adelaide, 8 c. 36
Bombay, 2 7
Hydro Carbon—
Brussels, 4 t. 4 c. £77
Insect Powder—
Lisbon, 6 41
Manure—
Hamburg, 340 t. £4,250
Havre, 120 1,320
Dunkirk, 30 375
Mackay, 10 92
Rouen, 19 14 c. 150
Sourabaya, 484 10 5,328
Motril, 300 3,000
Nitric Acid—
Jersey, 24 pks. £43
Phosphorus—
Hobart, 4½ c £39
Yokohama, 1,000 lbs. 115
Hiogo, 1,700 lbs. £205
Potassium Bichromate—
Brisbane, 1 t. 1 c. £38
Sulphuric Acid—
Natal, 5 t. 16 c. £22
Strontium Nitrate—
New York, 1 t. 14 c. £35
Sheep Dip—
Odessa, 1 cs. £6
Natal, 1 t. 8 c. 58
Brisbane, 250 gls. 29
Natal, 30 cs. 46
Saltpetre—
Gibraltar, 5 t. £115
R. Janeiro, 1 23
Superphosphate—
Libau, 400 t. £1 200
Stettin, 250 17 c. 1,050
Tartaric Acid—
Brisbane, 3 c. £22
Auckland, 5 33

LIVERPOOL.

Week ending July 5th.

Ammonium Sulphate—
Demerara, 52 t. 1 c. 2 q. £615
Barcelona, 10 120
Valencia, 5 59
Gr. Canary, 12 5 136
New York, 50 7 3 583
Valencia, 25 300
Ammonium Muriate—
Havre, 1 t. 1 c. 2 q. £20
New York, 5 3 124
Rotterdam, 14 13
Antimony Regulus—
Rotterdam, 17 t. 10 c. £1,220
Ammonium Carbonate—
Odessa, 5 t. 1 c. 1 q. £150
Genoa, 10 1 17
Halifax, 6 10
Leghorn, 1 5 1 42
Marseilles, 5 8
Montreal, 1 14 3 50
Alum—
Candia, 1 t. 8 c. £7
Christchurch, 1 6
Constantinople, 5 11 28
Callao, 7 4 37
Ibrail, 1 9 7
Sameoun, 2 10 13
Smyrna, 2 10
Sydney, 1 6
Valparaiso, 14 7 74
Calcutta, 15 1 76
Alexandria, 7 14 1 q. 39
Seville, 1 10 8
Valencia, 2 4 12
Bone Waste—
Stockholm, 24 t. 3 c. £238
Bleaching Powder—
Antwerp, 135 cks.
Barcelona, 50
Hamburg, 66
Montreal, 33
Leghorn, 27
New York, 312
Rouen, 88
Antwerp, 113
Bombay, 12 cs.
Chicago, 120 pks.
Hamburg, 171
New York, 44 100 brls.
Terneuzen, 25
Boston, 613
Venice, 5
Brimstone—
Calcutta, 5 t. 1 c. £24
Borate of Lime—
Rotterdam, 10 7 c. 2 q. £124
,, 9 15 175
,, 7 16 99
Borax—
Constantinople, 10 c. 1 q. £12
Lisbon, 4 1 6
Rotterdam, 1 t. 17 1 53
Sydney, 1 30
Ibrail, 10 14
Rotterdam, 9 13
Vigo, 1 4 1 34
Calcium Chloride—
Rouen, 5 t. 1 c. £9
Sydney, 5 t. £11
Caustic Soda—
Antwerp, 26 drms.
Bilbao, 118 17 brls.
Calcutta, 177
Callao, 30
Cartagena, 90 pks.
Fairwater, 83
Genoa, 45
Gothenburg, 36
Hamburg, 36
Kustendjie, 36
Leghorn, 27
Malaga, 46 11 brls. 50 kgs.
Malta, 28
Maranham, 5
Melbourne, 36
Montreal, 3 cks.
Naples, 56
Newfairwater, 34
New York, 800
Oddessa, 25
Penang, 200
Pernambuco, 50
Philadelphia, 50
Rotterdam, 57
Rouen, 20
San Francisco, 150 dms.
Seville, 54 brls. 65 120 kgs.
Stettin, 17 drms.
Tarragona, 30
Trieste, 28
Valencia, 25 25 brls.
Vigo, 19 brls.
Acajutla, 12
Algiers, 25
Antwerp, 15
Bahia, 50
Barcelona, 100
Bordeaux, 17
Boston, 245
Brisbane, 178
Callao, 10
Carthagena, 90 pks.
Chicago, 170
Coquimbo, 60
Dunedin, 80
Galatz, 37 100 kgs.
Genoa, 242
Gothenburg, 3 brls.
Hamburg, 25
Havre, 18
Leghorn, 62
Lisbon, 50
Malaga, 6
Malmo, 10
Malta, 30
Monte Video, 150
Nantes, 90
Newfairwater, 15
New York, 750 50 brls.
Norrkoping, 6
Odessa, 200
Oporto, 15
Palermo, 46
Passages, 100
Philadelphia, 135
Riga, 60
St. Petersburg, 420
Santo Domingo, 42
Stockholm, 25
Talcahuano, 20
Valencia, 18 25
Valparaiso, 30
Wellington, 25
Chloride of Lime—
New York, 108 t. £655
Carbolic Solid—
St. Louis, 4 t. 14 c. 2 q. £431
New Orleans, 1 7 1 71
New York, 2 5 250
Caustic Potash—
New York, 10 t. 18 c. £218
Rotterdam, 13 13
Copperas—
Madras, 2 t. 6 c. 1 q. £5
Carbolic Acid—
Bombay, 4 c. 1 q. £25
Hamburg, 11 3 53
Rotterdam, 10 42
New Orleans, 8 3 54
Lantander, 19 3 64
Copper Sulphate—
Bordeaux, 45 t. 3 q. £1081
Constantinople, 10 c. 13
Genoa, 29 18 1 720
Havre, 4 10 100
Bordeaux, 95 16 3 2,188
Newfairwater, 3 10 80
Syra, 6 8
La Union, 2 45
Constantinople, 12 2 10
Nantes, 70 5 1 1,750
Bilbao, 15 3 340
Bordeaux, 309 1 1 7,161
Brindisi, 5 1 100
Fairwater, 15 300
Singapore, 6 119
Stettin, 5 104
Odessa, 3 4 1 70
Genoa, 5 5
Bordeaux, 80 1 1 1,500
Patras, 8 1 10
Rouen, 225 398
Charcoal—
Rotterdam, 50 t. 14 3 q. £15
Citric Acid—
Philadelphia, 1 t. 6 c. £150
Chemicals *(otherwise undescribed)*
Hamburg, 39 pnds. £10
Lisbon, 5 t. 12
Rio de Janeiro, 11 c. 3 q. 32
Hamburg, 5 15
Disinfectants—
Calcutta, 15 c. £8
Epsom Salts—
Havre, 100 kgs.
Rio Janeiro, 50
,, 50 cks. 30 kgs.
Glycerine—
San Francisco, 4 cs. £17
Hamburg, 7 t. 12 c. 182
Ground Spar—
Havre, 22 t. 18 c. £821
Gypsum—
Boston, 11 t. 15 c. £33
Hypophosphate of Lime—
Calcutta, 1 cs. £25
Philadelphia, 1 8
Lead Nitrate—
Lisbon, 7 c. 3 q. 9
Manure—
Hamburg, 10 t. 5 c. 1 q. £48
Bordeaux, 200 5 2 1,242
St. Nazaire, 165 2 746
Magnesia—
New York, 30 cs. 3 crbs.
Valparaiso, 6
Adelaide, 20
Rio Janeiro, 20
Rosario, 6
Magnesium Chloride—
Rouen, 2 t. 14 £7
Oxalic Acid—
Constantinople, 6 c. 1 q. £12
Barcelona, 3 t. 9 94
Antwerp, 1 1 1 37
Potassium Silicate—
Amsterdam, 1 t. 3 c. 3 q. £6
Pitch—
Antwerp, 150 t.
Iquique, 15 brls.
Potassium Bichromate—
Piræus, 5 t. 1 c. 3q. £125
Potassium Carbonate—
New York, 7 t. 7 c. £103
Potassium Chlorate—
Copenhagen, 2 t. £90
Hamburg, 1 7 c. 59
Rotterdam, 3 126
Santos, 2 93
Stettin, 5 210
New York, 12 10 564
Genoa, 10 28
Corunna, 1 51
Leghorn, 2 5
Naples, 2 10 120
New Fairwater, 3 5 160
New York, 7 10 408
Rotterdam, 10 25
St. Petersburg, 3 150
Stettin, 1 10 80

Potassium Chlorate—*continued.*

Valencia, 1 t. £46
Odessa, 10 c. 25
Gothenburg, 10 445
Corunna, 9 19
Naples, 10 24
Sydney, 5 210

Sodium Nitrate—

Syra, 15 c. £7
Montreal, 1 t 17 3 q. 17

Superphosphate—

Gr. Canary, 10 t. £28

Soda Ash—

Baltimore, 136 cks. 257 tcs.
Boston, 143
B. Ayres, 60 brls.
Calcutta, 6
Callao, 30
Corfu, 50
Genoa, 129
Kingsey, 13
Maranham, 20
MexicoCity 107
Montreal, 41
N.Orleans, 129
New York, 439 1,850
Odessa, 150
Philadelphia, 81
Rio Janeiro, 20
Salonica, 25
Santos, 20 10
Sherbrooke, 16
Stockholm, 2
Sydney, 8
,, 8
Toronto, 3
Varna, 135
Waterloo, 2
Zante, 100
Baltimore, 228
Bilbao, 50
B. Ayres, 200
Carthagena, 38
Constantinople, 60 brls.
Monte Video, 100
New York, 327 cks.
Oporto, 5 10 10 pps.
Rio Janeiro, 50
Santos, 50
Syra, 108
Vigo, 15
Monte Video, 50

Salt—

Adelaide, 140 t.
Amsterdam, 66
Barbadoes, 22¼
CharlotteTown, 288
Chicago, 165
Chittagong, 2,900
Halifax, 600
New York, 160
Rio Janeiro, 65 cs.
Rotterdam, 184
Sherbro, 100
Sinoe, 15
Sydney, 97
Antwerp, 100
Boston, 20
Brisbane, 2,200 sks.
Rosario, 40
Barbadoes, 315
Barcelona, 50
Boston, 200
Charleston, 560
Ghent, 100
Hamburg, 118
Manaos, 19 12 c.
Montreal, 848
Nakskov, 215
Para, 17¾
Reykjavik, 117
San Francisco, 252
Sinoe, 10
Trinidad, 49 10
Valparaiso, 159 10

Sodium Bicarbonate—

Adelaide, 100 kgs.
Antwerp, 55
Bombay, 100
Brisbane, 100
B. Ayres, 200 100 cks.
Calcutta, 25
Callao, 30
Copenhagen, 21 8
Hamburg, 29 27 7 brls.
Iquique, 4
Leghorn, 100
Madras, 100
Montreal, 300
New York, 200
Odessa, 250
Rotterdam, 20
St. Petersburg, 200
Seville, 120
Sydney, 170 40
Valencia, 50
Valparaiso, 100

Sodium Silicate—

Alicante, 10 cks.
Para, 12 brls.
Rotterdam, 14
Seville, 17
Valencia, 15
Bilbao, 20
Venice, 32

Soda Crystals—

Adelaide, 67 brls.
Alexandria, 34
Boston, 280
Calcutta, 30
Halifax, 20
Hamburg, 1 ck.
Malta, 50
New York, 840
Philadelphia, 87
Salonica, 7
Seville, 7
Woodstock, 100 kgs.
Bilbao, 14
Boston, 140
Gibraltar, 20

Sodium Bichromate—

Genoa, 2 t. 3 c. £60

Sodium Biborate—

Guantanamo, 3 c. 1 q. £5
Hamburg, 1 t. 1 2 32
Antwerp, 4 11
Hong Kong, 5 19 179
Montreal, 6 18 1 210
Yokohama, 3 11 2 100

Salt Cake—

Montreal, 99 t. 3 c. £248

Sodium Phosphate—

Lisbon, 5 c. 3 q. £10

Sodium Chlorate—

New York, 2 t. 10 c. £131

Sugar of Lead—

Montreal, 2 t. 3 c. 1 q. £37

Sulphur—

Boston, 25 t. 1 c. £106
New York, 153 9 666
Boston, 32 8 135
Akassa, 10 5 2 q. 62
New York, 75 338
Rangoon, 5 23
Rouen, 30 4 131

Sheep Wash—

Montreal, 1 t. 3 c. 2 q. £55
New York, 2 13 85

Saltpetre—

Bahia, 17 c. £20
Syra, 1 t. 5 2 q. 28
Halifax, 10 11
Piræus, 3 15 82
Odessa, 2 10 54
Para, 5 6

Salammoniac—

Odessa, 2 t. 2 q. £75
Alexandria, 15 c. 26
Kurrachee, 1 10 52
Beyrout, 11 2 20
Merseyne, 3 5
New York, 4 18 166
Trieste, 1 34

Sulphuric Acid—

Iquique, 5 c. £6

Sodium Stannate—

San Sebastian, 5 c. £10

Tar—

Santander, 6 cks.

Tin Phosphate—

Carthagena, 10 c. £80

Zinc Muriate—

Bombay, 1 t. 1 c. 3 q. £18

Zinc Chlorate—

Genoa, 1 t. 3 c. £22
Bombay, 11 1 q. 28

GRIMSBY.

Week ending July 5th.

Coal Products—

Dieppe, 60 cks.

Chemicals (*otherwise undescribed*)

Melbourne, 456 cks.

TYNE.

Week ending July 9th.

Alkali—

Riga. 2 t. 17 c.
Christiania, 5 5
Rotterdam, 1 2

Alum—

San Francisco, 20 t. 3 c.

Ammonium Sulphate—

Rotterdam, 30 t. 9 c.

Bleaching Powder—

Lisbon, 21 t. 13 c.
Gothenburg, 20 6
,, 12 2
Riga, 3 2
,, 23 17
Bergen, 11
Hamburg, 39 19
Rotterdam, 10 19
Antwerp, 1 5
,, 91 5
Hamburg, 10 12
Bergen, 5
Christiania, 20 6
San Francisco, 50 2
Bilbao, 11 9
Copenhagen, 14 4
Rotterdam, 12 9
,, 9 17
,, 19 3
Libau, 13 19

Barytes Carbonate—

Odessa, 10 t. 10 c.
Rotterdam, 50

Copperas—

San Francisco, 28 t.

Caustic Soda—

Gothenburg, 25 t. 4 c.
Antwerp, 2 12
Bilbao, 9
Copenhagen, 6 16
Wyburg, 51 11

Litharge—

Gothenburg, 5 c.
Riga, 1 t. 14
Hamburg, 5
Antwerp, 2 4
Odessa, 1 4
Copenhagen, 11

Magnesia—

Hamburg, 3 c.

Naphthaline—

Riga, 25 t. 17 c.

Potassium Chlorate—

Riga, 1 t. 15 c.
Rotterdam, 5 10
Hamburg, 1 2
Rotterdam, 10

Sodium Nitrate—

Gothenburg, 19 c.

Soda—

Rotterdam, 5 t. 7 c.
Antwerp, 5 7
Aarhuus, 24 10
Frederickshavn, 1 17
Esbjerg, 5 7
Malmo, 5 7
Christiania, 7 10

Soda Ash—

Copenhagen, 4 t. 3 c.
Rotterdam, 1 6
Lisbon, 20 10
Gothenburg, 22 10
Riga, 9 12
Antwerp, 5 11
San Francisco, 50 8

Sodium Chlorate—

Antwerp, 1 t. 13 c.

Sodium Silicate—

Bilbao, 11 t. 19 c.
Libau, 9 18

Superphosphate—

Riga, 484 t. 7 c.
,, 150 4

Tar—

Riga, 6 t. 2 c.
Bergen, 14

GLASGOW.

Week ending July 10th.

Benzole—

Rotterdam, 20 drms. £170

Borax—

Boston, 23¾ c. £45

Chemicals (*otherwise undescribed*)

Karachi, 110¼ c. £24

Dyestuffs —

Logwood

Montreal, £84

Manganese Oxide—

New York, £95

Manure—

Demerara, 10 t. £95

Paraffin Wax—

Japan, 22,217 lbs. £143

Pitch—

Rangoon, 5 t. £25

Potassium Bichromate—

New York, 184 c. £343
Rotterdam, 59 cks. 388
Boston, 329 £615

Sulphuric Acid—

Rangoon, 11 t. 17¼ c. £132
Karachi, 27 13 141

Sodium Bichromate—

New York, 176 c. £246
Boston, 314 439

Sulphur—

Trinidad, 6 t. 3½ c. £37

Tar—

Karachi, 36 t. 4 c. £100

Turpentine—

Madras, 19¾ c. £32

HULL.

Week ending July 8th.

Alkali—

Libau, 45 kgs.
St. Petersburg, 180 cks.

Bone Size—

Bremen, 10 cks.
Hamburg, 2
Harlingen, 11
Rotterdam, 2

Bleaching Powder—

Amsterdam, 10 ckss.
Copenhagen, 1
Hamburg, 33

Caustic Soda—

Antwerp, 66 drms.
Libau, 36

Chemicals (*otherwise undescribed*)

Antwerp, 26cs. 18 cks. 1 pkg.
Amsterdam, 48 16
Bremen, 92
Bordeaux, 20 50
Christiansand, 335 albs.
Christiania, 21 169
Dunkirk, 1 30 drms.
Danzig, 34
Gothenburg, 20 45 pks.
Hamburg, 147 30 15
Konigsberg, 6
Malta, 12
New York, 29
Rouen, 26
Rotterdam, 29 36 59
Riga, 35
St. Petersburg, 3 25 320
Stettin, 4 20
Stockholm, 25

Dyestuffs (*otherwise undescribed*)

Antwerp, 3 cks.
Dunkirk, 100 bgs.
Hamburg, 4 drums.
Rotterdam, 3 kgs. 3 cs. 5 cks.

Manure—

Ghent, 10 t.
Hamburg, 36
New York, 454 bgs.
Rotterdam, 192
Stettin, 145

Pitch

Antwerp, 169 t.
Dunkirk, 70

Salt—

Copenhagen, 100 c.

Tar—

Hamburg, 10 cks.

GOOLE.

Week ending July 2nd.

Alkali—

Dunkirk, 30 drums.

Benzole—

Antwerp, 26 cks.
Hamburg, 14 drums
Rotterdam, 121 cks.

Coal Products—

Ghent, 5 cs. 20 drums
Rotterdam, 160 cks.

Chemicals (*otherwise undescribed*)

Hamburg, 120 cks.

Dyestuffs (*otherwise undescribed*)

Ghent, 1 cs. 1 drums.
Rouen, 5
Hamburg, 175 bgs.

Manure—

Boulogne, 62 bgs.
Dunkirk, 627

Pitch—

Antwerp, 396 t.

PRICES CURRENT.

WEDNESDAY, July 16, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 % and 40 % .. .. per cwt.	7/- &	12/3	
,, Glacial .. .. ,,		64/-	
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3¾
Picric .. .. ,,	0	1	1½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2½
Arsenic, white powdered .. .. per ton	13	5	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	10	0
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	15	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- &	35/-	
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	10	0
,, ,, (grey), Hull .. .. ,,	11	7	6
Aniline Oil (pure) .. .. per lb.	0	0	10½
Aniline Salt ,, ... ,,	0	0	9¼
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to	75/-	
Bleaching Powder, 35 % .. .. ,,	5	5	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	13	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	2	6
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to	35/-	
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	3	10
,, 50/90 ,, ... ,,	0	2	10
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	8
,, (crude 60°) .. .. per gallon	0	2	2
Creosote (ordinary) .. .. ,,	0	0	3
,, (filtered for Lucigen light) .. .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	8	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2½
Copper (Chili Bars) .. .. per ton	57	15	0
,, Sulphate .. .. ,,	20	0	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	22	0	0

	£	s.	d.
Lime, Acetate (brown) .. .. ,,	7	7	6
,, ,, (grey) .. .. per ton	13	0	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- &	42/6	
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	1½
Oils:—			
Cotton-seed .. .. per ton	22	10	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	19	10	0
,, Chlorate .. .. per lb.	0	0	4½
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	22	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	21	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	20	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	2 5/16
,, Nitrate .. .. ,,	0	2	8
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	2	6
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	5	0
,, ,, (Soda Crystals) .. .. ,,	2	15	0
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	10	17	6
,, ,, (74 % Caustic Soda) ,, .. ,,	10	10	0
,, ,, (70 % Caustic Soda) ,, .. ,,	9	15	0
,, ,, (60 % Caustic Soda, white) .. ,,	8	15	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	7	17	6
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	1½
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	3	17	6
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	7	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8
,, Barium, 95 % .. .. ,	0	0	5½
,, Potassium .. .. ,,	0	0	8¼
Sulphur (Flowers) .. .. per ton.	8	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	5	0
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	99	10	0
,, Crystals .. .. per lb.	0	0	6¼
Zinc (Spelter) .. .. per ton.	23	0	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	0	0

THE

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THE CHEMICAL UNION.

FERTILE as the last few years have been in trade combinations, the huge undertaking which comes before the public under the name of the Chemical Union, has an interest that is peculiarly its own. To our mind it is the last act of a great drama—an act which will depend for its duration in great measure upon the ability of the players themselves.

As might be expected under the circumstances, reliable information is somewhat scarce; but, assuming the capital of the union to be, as we are told it is, ten millions, the amount does not seem to us to be at all out of proportion to the vastness and importance of the scheme. An industry which produces, per annum, 150,000 tons of bleaching powder, and 180,000 tons of caustic soda, in addition to soda ash, soda crystals, and chlorate of potash, must of necessity require a large and expensive machinery for its manipulation and supervision.

Our readers are already acquainted with our views upon trusts and syndicates, and sooner or later this particular trust will follow in the footsteps of its predecessors. But that day should not be yet at hand, for we must confess that no other project of the kind put forward within recent years has established a better claim to consideration, or shown greater likelihood of temporary success. We say "temporary" advisedly, for we regard the old Leblanc process as doomed. It will go to its grave full of years and honours, but neither years nor honours can avail to stem the tide of invention that is slowly, but surely, accomplishing its fall.

In the meantime, however, the alkali manufacturers have, it seems to us, a good opportunity of securing to themselves a period of comparative ease and plenty before the inevitable dissolution. Why they have been so long in making up their minds to do something to protect themselves, has been a great source of wonder to us, and we had almost begun to think that the low prices that have now been ruling for so long, were due to a praiseworthy and disinterested benevolence on the part of the producers—to a desire to give the rest of their fellow creatures a sufficiency of bleach and caustic, with a minimum of pecuniary obligation.

Now, however, our mind is in equilibrium again, and we once more see in the alkali-maker, the practical man of business, actuated by the not necessarily unlaudable desire to amass his modest pile. Ill-natured folks may say that this desire has never been conspicuous by its absence, in fact, that it has been the cause of failure in all previous attempts to form a combination. Be this as it may, the manufacturers ought to be thoroughly alive to the fact, that if success is to attend their efforts, a liberal give-and-take spirit must have place in their council. There will be many conflicting individual interests, and unless these be cordially reconciled, there can be little stability attaching to the combination. But in order to further this end, the individual should drop all unnecessary minor claims (which are simply so many hindrances to the attainment of the main object in view), and content himself with the broad general advantages that must

necessarily accrue to him through the operation of a well managed combination. The general public will have to pay more for their bleach and caustic, (and doubtless other chemicals will rise in sympathy), but of the two evils, we are inclined to think that the continuance of the alkali trade depression would be the greater.

CHEMICAL ENGINEERING.*

XXVII.

WEIGHING AND MEASURING.

HEAT measuring has been briefly described in chapter IV., but only as a means of illustrating how large scale experiments may be carried on in the laboratory. In the course of actual manufacturing, heat measuring is even more important than in the laboratory, but, unfortunately, the instruments at our disposal for the measurement of temperature do not help us much beyond a certain figure. The main difficulty in the construction of high temperature heat-measuring apparatus is the selection of material of which the apparatus can be made. When we remember that platinum melts below 1,890°C., cast iron below 1,100°C., limeglass at about 1,900°C, and many varieties of fire clay at 2,000°C., the difficulties of construction will become apparent.

The following temperatures of known physical crises are generally accepted as being fairly accurate, those with an asterisk (*) may be depended upon for accuracy, and those marked (†) to within a few degrees; so that a range of temperature from the melting of ice to that of platinum can be fairly well established. There may be gaps difficult to fill, but the existence of well defined stepping stones will, no doubt, be of great service, and help to fix in the minds of chemical engineers the effect of temperature which might otherwise be neglected.

Substance.	State.	°C.	°F.
*Ice	Melts at	0°	32°
*Water	Boils ,,	100°	212°
*Tin	Melts ,,	235°	455°
*Lead	,, ,,	336°	637°
*Mercury	Boils ,,	360°	680°
†Zinc	Melts ,,	410°	770°
*Sulphur	Boils ,,	448°	838°
†Aluminium	Melts ,,	625°	1,157°
†Gold	,, ,,	1,100°	2,012°
Steel	Fuses ,,	1,300°	2,372°
†Palladium	,, ,,	1,500°	2,732°
†Platinum	,, ,,	1,800°	3,272°
Firebrick	Fuses about	2,000°	3,632°

Gold, silver, and copper are generally rated to fuse at about 1,000°C. to 1,050°C. (about 2,000°F.), and cast iron at 1,275°C. (about 2,300°F.), and platinum fusing at 1,800°C. melts when thrown onto the surface of molten glass.

Some scientists attach great importance to the *exact* determination of temperature in manufacturing processes. There is no doubt that in many operations where reactions take place in specified and very narrow limits, the exact determination of the degree of heat employed is a very important matter, and we should in all cases endeavour to arrive at as near the truth as possible, but unless there is a definite and valuable point in making determinations of such great accuracy, it is as well not to overlook the fact that the game may not be worth the candle.

The most common method of ascertaining temperature, is by the unaided eye; we speak of the heat as dull red, cherry red, orange, and white, and by it we mean, no doubt, to be definite in our description, and certainly workmen who are trained to observe temperature-colour can observe very well, still, the untrained eye may be very seriously in error.

* A course of lectures delivered by Mr. George E. Davis, at the Manchester Technical School.—*All rights reserved.*

For my own part, I have had experience in three processes requiring careful regulation of heat, the Hargreaves salt cake process, the Deacon chlorine process, and the carbonizing of coal, and therefore can speak with authority upon the subject. I have found that a good, steady fireman, when in perfect health, may train his eye to keep very steady heats by means of his eye alone, but the state of a man's health does materially affect his colour perception, and, moreover, heat determinations conducted by this method should only be made when the eyes are completely shaded from extraneous light. It is difficult to say what is the lowest degree of heat that can be seen, perhaps 400°C. has been observed, but dull red is generally taken to mean 500°C.; cherry red 800°C.; orange red 1,000°C.; white-heat 1,300°C.; while the dazzling white-heat of the glass furnace cannot be less than 1,500°C. to 1,900°C. For temperatures above 1,000°C., the colour is oftimes observed through a piece of cobalt blue glass, which softens the light by absorbing the yellow part of the spectrum, but the use of this medium requires considerable practice. The following table may put these temperatures in a more graphic form.

TEMPERATURES.

Black heat	400°C.	Orange red heat	1,000°C.
Dull red heat	500°C.	White heat	1,300°C.
Cherry red heat	800°C.	Dazzling white heat	1,500°C.

Pouillet has stated that a thin plate of platinum takes the following colours at the indicated temperatures, his own terms are given so that there may be no mistake as to the meaning.

Rouge foncé dans l'obscurité	525°C.
Rouge sombre	700°C.
Cerise naissant	800°C.
Cerise clair	1,000°C.
Orange foncé	1,100°C.
Orange clair	1,200°C.
Blanc	1,300°C.
Blanc soudant	1,400°C.
Blanc éblouissant	1,500° to 1,600°C.

As I have already shown, the mercury thermometer may be employed for all temperatures, say up to 340°C., or say 640°F., up to which I have frequently gone in testing chimney gases, with average accuracy when using Phillips' maximum registering thermometer. An instrument for measuring temperatures from 300°C. to 1,000°C. is still much required, or even to 1,500°C., but as steel melts at 1,300°C., I fear that platinum is the only suitable metal, and therefore not available, except for determinations of more than ordinary importance.

Pyrometers are much used for temperatures varying from 300°C. to 600°C., but I have not found one single make yet that would work continuously and give satisfaction, but I have on many occasions known that the fireman has found the pyrometer out of order, by comparison with the temperature colour. I am speaking now of pyrometers working on the principle of the differential expansion of two dissimilar substances; there may be others more reliable, but, anyhow, they are not in general use.

Pyrometers, to be of any material service, should not only be able to indicate the actual temperature at the time, but to detect variations in the temperature, so as to give ample warning to the fireman before actual damage is done. The material in manufacturing operations often takes a long time in heating up, and when a critical point is reached, it will probably take as long or longer to cool down, the cooling being very uncertain when some chemical change is taking place in which heat is evolved. There are, however, two forms of pyrometer that deserve careful trial, Murrie's is one form, the other is Schäffer and Budenberg's Thal-potassimeter. In Murrie's pyrometers the action of the instruments can readily be understood by comparison with an ordinary mercurial barometer. In the barometer the pressure only of the atmosphere is taken into account, no allowance being made for variations in the temperature of the atmosphere. As mercury volatilizes in a vacuum, it is evident that under certain conditions the tension of the mercurial vapour in the space intermediate to the upper surface of the column of mercury and the sealed end of the tube, known as the vacuum space, may be

sufficient to affect the height of the column of mercury to a greater or less extent. For instance, assuming the tube to be enveloped by air heated to nearly 680° F.—the boiling point of mercury under the normal atmospheric pressure—the tension of the vapour will balance the pressure of the atmosphere, and in consequence, the column of mercury in the barometer tube will be depressed to the same, or nearly the same, level as that of the mercury in the receiver. Moreover, any decrease in the temperature of the surrounding atmosphere will cause the vapour of mercury to partially liquefy and the column of mercury to ascend. Supposing that instead of the lower end of the tube to be open to the atmosphere, the tube is sealed by a sensitive pressure gauge, and the tube heated as before, the mercury could not then descend, but the tension of the vapour would be transmitted through the intermediate column of mercury to the pressure indicator, and any variation in the tension of the vapour due to heating or cooling of the mercury at the point of contact with the vapour, would at once be shown on the indicator, which could be graduated to show the corresponding temperature. On this basis about 60 forms of instruments are constructed, embracing nearly all ranges of temperature met with in practice.

These instruments are reported to be in use in many chemical establishments, but I have not been able to secure any reliable reports regarding them. Some of the purposes for which they are specially constructed may perhaps be mentioned here. From 0° F. to 50° F. for use in refrigerators, cooling chambers, etc.; to temperatures up to 300° F., with a range of 100° F., for heated water or steam; for temperatures from 300° F. to 1,000° F., with a range of 300° to 600° on each dial. A series has been made for tar distillers, stearine stills, and oil stills, ranging on each dial from 300° to 600° F.; 350° to 800°; 350° to 900°, and 400° to 1,000° F. For hot-air blast, superheated steam, a set has been devised ranging from 400° F. to 2,000° F. The price of these instruments varies from three to six guineas each.

Two special instruments are constructed to guide the attendant in the heating and cooling of caustic soda, viz., an instrument ranging from 1,000°F. to 1,400°F., to show the temperature of the material as it is being heated, and also to show when sufficient heat has been applied; and a second instrument ranging from 400° F. to 800° F., to show when the material has sufficiently cooled down to be removed from the pots.

The construction of the Thal-potassimeter is based on the well-known fact that the pressure of a saturated vapour corresponds to its temperature.

The instrument consists of a metal tube (brass or iron) of sufficient strength, partly filled with a suitable liquid (ether, water, or mercury), which is exposed to the influence of the temperature to be ascertained, and connected with a pressure gauge, by means of which the pressure imparted to the vapour is indicated. The dials are graduated by actual experiment, the temperature corresponding to the different pressures being calculated on the basis of Regnault's tables.

For low temperatures the tube is generally of brass and partly filled with ether, the dial being graduated from 100° to 220°F., for temperatures varying from 212°F. to 680°F. the liquid is water and the tube of iron or brass, while for heats above 680°F to say 1,500°F the tube is iron or steel and the liquid mercury. I have used these pyrometers for several years, and, if carefully fixed and used, they are reliable; after a time, however, the fluid escapes somewhat or becomes changed in character, and the instrument must be overhauled and adjusted. All high temperature pyrometers must be protected against oxidation. For this purpose an outer iron protecting tube is requisite, which should be partly filled with lead. The lead forms a bath, excludes the air and so prevents the oxidation of the pyrometer tube. The price of each of these Thal-potassimeters is about five guineas.

In several instances I have known of the successful employment of air thermometers made from porcelain tubes *glazed inside*, but the joints are apt to give way in time; still the possibility of their use deserves to be remembered.

Fusible masses and fusible alloys are also capable of great employment, and I think that before any range of pyrometer is selected, the temperatures should be first roughly determined by their means, and before a mercury thermometer is plunged into a flue, for instance, it should be ascertained that the temperature is below the fusing point of lead. The mistakes that have been made in these matters, within my own knowledge, would make a very amusing lecture in this series.

Siemens' copper ball pyrometer has been described in Chapter IV., to ensure fairly accurate figures, the rise of temperature of the water should not exceed 2°C., and it is well to cool the water, say 2° below the temperature of the air, before adding the heated metal, in order that the heat lost by radiation should be reduced to a minimum.

Siemens' electrical pyrometer depends upon the fact, that the electrical resistance of metallic conductors depends upon their dimensions, material, & temperature. An increase in temperature causes a corresponding increase of resistance, the law of which is known. The resistance of a conductor having been ascertained at 0°C., it can be also calculated for a higher temperature, and as the resistance can be measured, the temperature can be easily calculated. This is the principle upon which Siemens' electrical pyrometer is based.

A platinum wire of a known resistance at 0°C., is coiled on a cylinder of fireclay, so that the convolutions do not touch each other. This coil is protected by a platinum shield, which is placed in an iron or platinum tube. Leading wires are arranged to connect the coil with an instrument suitable for measuring the varying resistance from which the temperature can be calculated. The instrument employed for measuring the resistance is a differential voltameter, which consists of two separate glass tubes, containing a dilute solution of sulphuric acid in water, this solution is decomposed by an electric current passing between two platinum electrodes. The gas which is generated is collected in the upper portion of the tubes, and measured off by means of the graduated scale.

The current from the battery is divided by a commutator into two circuits, one of which consists of a constant resistance in the instrument and the platinum electrodes in one tube, the other, of the resistance to be measured, and the electrodes in the other tube. The quantities of gas developed in the two tubes are in inverse proportion to the resistances of their respective circuits, and the resistance in the instrument being known, the other can be calculated.

This instrument is very costly, and is not much employed on account of difficulties in its use. Theoretically, it is ingenious, and may be accurate in the hands of physical experimenters, but its use in an ordinary manufacturing establishment is out of the question.

(To be continued.)

Legal.

SUPREME COURT OF JUDICATURE.—COURT OF APPEAL.

(*Before* LORD ESHER, LORD JUSTICE LINDLEY, *and* LORD JUSTICE BOWEN.)

IN THE MATTER OF AN INTENDED ARBITRATION BETWEEN SMITH AND SERVICE AND NELSON AND SONS.

This case was of great interest to mercantile men—who have for more than two centuries been (and are now more than ever) in the habit of agreeing to refer their disputes to arbitration—for it raised the question whether such agreements to refer to arbitration can be enforced by one party against the other. It had arisen under these circumstances. The plaintiffs, Smith and Service, a firm of shipowners, had last year chartered a vessel of theirs to the defendants, Nelson and Co., the charter stipulating that the vessel should arrive and be placed at the disposal of the charterers on a certain day, and it contained the usual clause for referring any disputes that might arise to three arbitrators, one to be chosen by each party and the third by those two. The vessel did not arrive until two days after the day appointed, and the charterers threw her up. The shipowners claimed damages and proposed to proceed under the arbitration clause and appointed their

arbitrator, and called upon the charterers to appoint theirs, which they, however, refused to do. The shipowners having appointed their arbitrator, made the agreement of reference a rule of Court, and applied for an order to enforce it by compelling the charterers to appoint their arbitrator. The Master made an order upon them to appoint an arbitrator, and the Judge at Chambers upheld the order, the Arbitration Act of last year, section 1, enacting that "a submission to arbitration shall be irrevocable except by leave of the Court or a Judge, and shall have the same effect in all respects as if it had been made a rule of Court." From the time of the first Arbitration Act (William III) a reference to arbitration could have been revoked. The Act of 3 and 4 William IV., c. 429, provided that it could not be revoked after being made a rule of Court. The Common Law Procedure Act, 1854, contained various provisions to enforce references to arbitration, but contained none to meet the case which had now arisen, neither did the late Act contain any express provision to meet it, and, though the contention of the shipowners was that in effect the above enactment did meet it, the contention of the charterers was that it did not meet it. They, therefore, appealed to the Divisional Court against the order, but the Court upheld it, and then the charterers appealed to this Court. (The case was reported in *The Times* on the 20th of June)

Mr. French, Q.C. (with Mr. C. A. Russell), appeared for the appellants.

Mr. Barnes, Q.C. (with Mr. Leck and Mr. Hurst), appeared on behalf of the shipowners in support of the order.

Their Lordships, after conferring together, allowed the appeal and set aside the order.

Lord Esher, in giving judgment, said the question arose on a usual clause of arbitration, only the reference was to be to "three arbitrators," not two arbitrators and an umpire. The submission was, however, made a rule of Court when only one of the parties had appointed his arbitrator and the other party refused to appoint one. The Court made an order that he should appoint one, and the question was whether the Court had jurisdiction to make such an order. It was said that the case came within the late Act—that is, within section 1—and that that section gave the Court power to make the order. If the Courts had not had such a power before, had that Act given it? It was admitted that ever since the Act of William III. the Courts had never exercised such a power; but it was said the question had never arisen, and no one had raised it. But was it credible that during all that long period the power had existed though it had never been exercised, even during the half-century that had elapsed since the Act of William IV.? And, again, parties had had recourse to the Courts of Chancery to enforce submissions to arbitration, but the Courts had declined to exercise such a power—that is, there was no power, either in the Courts of law or equity, to make such orders to enforce submissions to arbitration. When, indeed, the arbitrators had been appointed the statutes gave certain powers and the submissions were made "rules of Court" for that purpose, but only after arbitrators had been appointed. From the time of William III., indeed, down to the Act of William IV., either of the parties could revoke his submission, even after it was made a rule of Court, which showed that the Court could not enforce the submission. Then the Act of William IV. made the submission irrevocable if made a rule of Court—that is, after the arbitrators had been appointed, for it was the reference to the arbitrators which was revoked. Then the late Act provided that the submission should be irrevocable—that is, the submission to particular arbitrators appointed—for the agreement to refer could never be revoked, as an action always could be brought upon it. The submission was to have the same effect as if made a rule of Court—that is, after arbitrators had been appointed. Then it followed that the new Act did not give the power to order a party to appoint his arbitrator. There was the same power as before, when the submission to arbitrators appointed had been made a rule of Court. A party could not now, any more than before, be ordered to appoint an arbitrator. The Divisional Court, therefore, had stretched the new Act beyond its true effect, and their order was made without jurisdiction. The appeal, therefore, must be allowed.

Lord Justice Lindley concurred, and observed that it was admitted that down to the late Act no such order had been made, and the late Act did not give the power to make such an order. If it had existed before the late Act, it was unaccountable how it should never have been exercised before. The order was opposed to the view of the law which had prevailed for two centuries.

Lord Justice Bowen concurred, and observed that an agreement to refer was always irrevocable by one of the parties, though the authority of the arbitrator could be revoked, which implied, however, that a submission meant a submission to arbitrators appointed, which formerly was, but now was not, revocable—that is, provided the arbitrators had been appointed. The arbitrators, therefore, must have been appointed to render the submission irrevocable. But here the arbitrators had not been appointed, and there was not and never had been a power in the Courts to compel parties to appoint arbitrators. The general agreement to refer to arbitration could not thus be enforced. No one had ever heard of an attachment against a party for not appointing his arbitrator in accordance with his agreement to refer. The order, therefore, in this case could not be maintained.

Appeal accordingly allowed.

A NEW WHITE LEAD PROCESS.

THE evils attending the manufacture of white lead by the Dutch or stack process are too well known to require insisting on. They may be summed up as—expensiveness, tediousness, and serious danger to health. Attempts have been made from time to time to introduce other methods of manufacture, which have been recorded by us. These, for the most part, have proved failures. Another process for attaining the desired end inexpensively, quickly and safely has just been brought under our notice. This process is the invention of Professor McIvor, F.I.C., and has been in operation for the past nine months at the experimental works, 47, Clapham-road, London. In this process of manufacture, which was recently inspected, the litharge is first made from lead ore and then thoroughly purified by washing. It is then put in a vat which is fitted with stirring apparatus, and a solution of acetate of ammonia is run into the vat upon the litharge. The mixture is then agitated for six hours, so that the lead is absorbed into the solution, and it is allowed to settle. The supernatant liquor containing the lead is then pumped over into a second vat, in which it is submitted to the action of carbonic acid gas. By this means the lead is precipitated and the acetate of ammonia recovered for use over again. If the litharge is very pure the carbonic acid gas is introduced into the first vat, with the result that the white lead is produced direct and the acetate of ammonia separated at the same time for re-use as before. In either case, after the white lead has been precipitated, the mother liquor is drawn off and the unwashed white lead is passed through filter presses to extract from it all the mother liquor. The pressed lead is then put in a washer and agitated by stirrers in cold water. After eight of these agitated washings, the white lead is again passed through the filter presses and through a hydraulic press, from whence it is removed to the drying room, and, when dry, is ready for use. The result is a pure white lead, free from crystals and produced in a few hours, as against months by the ordinary method, the cost of production being also much less. The process and the products have been examined by several leading chemists. All the operations in the manufacture of lead under this process are done in the wet, so that there is no dust, and therefore no danger to health from that source.

SULPHUR EXPORTS FROM ITALY.

THE official returns show that the gross exports of raw and refined sulphur from Italy, up to the end of May last, amounted to 1,700,106 quintals, in contrast with 1,503,394 quintals in the same five months last year, this being an increase of 196,712 quintals This export is valued at 11,900,742 lire, in 1890, and 10,523,758 lire 1889, thus showing on advance on the gross value of 1,375,984 lire. The official valuation puts sulphur at 7 lire per quintal. The destination of the exports is given, as presented in the annexed table, for the first five months of the last three years:—

Exported to	Quintals 1888	Quintals 1889	Quintals 1890	Difference 1890 on 1889
Austria-Hungary ..	64,816	61,191	90,184	+ 28,993
Belgium	21,468	45,485	33,991	— 11,494
France	307,360	333,203	404,876	+ 71,673
Germany	72,772	61,925	60,115	— 1,810
Great Britain ..	193,587	169,787	137,174	— 32,163
Greece	64,345	102,935	137,679	+ 34,744
Holland	7,223	8,824	6,607	— 2,217
Portugal	85,130	106,252	173,121	+ 66,869
Russia	18,638	87,157	53,666	— 33,491
Spain	50,220	49,166	51,510	+ 2,344
Sweden and Norway	4,803	19,097	29,284	+ 10,187
Turkey	10,290	25,246	57,269	+ 32,023
North America ..	545,068	410,267	437,293	+ 27,026
Central and South America ..	45,995	7,629	1,686	— 5,943
Other countries ..	10,131	15,230	25,651	+ 10,421
Total ..	1,501,746	1,503,394	1,700,106	+ 196,712

The position of the trade is so clearly shown in the foregoing that there is no need for comment.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

JOSEPH AIRD, GREATBRIDGE.—Iron tubes and coils of all kinds.

ASHMORE, BENSON, PEASE AND CO., STOCKTON-ON-TEES.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

BLACKMAN VENTILATING CO., LONDON.—Fans, Air Propellers, Ventilating Machinery.

GEO. G. BLACKWELL, LIVERPOOL.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

BRUNNER, MOND AND CO., NORTHWICH.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

BUCKLEY BRICK AND TILE CO., BUCKLEY.—Fireclay ware of all kinds—Slabs, Blocks, Bricks, Tiles, "Metalline," &c.

CHADDERTON IRON WORKS CO., CHADDERTON.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. CLAY, EDINBURGH.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

CLAYTON ANILINE CO., CLAYTON.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. CORTIN, NEWCASTLE-ON-TYNE.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. DAGLISH AND CO., ST. HELENS.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

DAVIS BROS., MANCHESTER.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. DEMPSTER, MANCHESTER.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

DOULTON AND CO., LAMBETH.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. FAHRIG, PLAISTOW, ESSEX.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

GALLOWAYS, LIMITED, MANCHESTER.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

JOHN A. GILBERT AND CO. LTD., LONDON.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

GRIMSHAW BROS., LIMITED, CLAYTON.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

JEWSBURY AND BROWN, MANCHESTER.—Samples of Aerated Waters.

JOSEPH KERSHAW AND CO., HOLLINWOOD.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. LINDSEY AND CO., CLAYTON.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

CHAS. LOWE AND CO., REDDISH.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

MANCHESTER ANILINE CO., MANCHESTER.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

MELDRUM BROS., MANCHESTER.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. MILNES AND BROTHER, BURY.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

MUSGRAVE AND CO., BELFAST.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

NEWCASTLE CHEMICAL WORKS COMPANY, LIMITED, NEWCASTLE-ON-TYNE.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

ROBINSON, COOKS, AND COMPANY, ST. HELENS.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. ROYLE, MANCHESTER.—Steam Reducing Valves.

A. SMITH, CLAYTON.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

WORTHINGTON PUMPING ENGINE COMPANY, LONDON.—Pumping Machinery. Speciality, their "Duplex" Pump.

JOSEPH WRIGHT AND COMPANY, TIPTON.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

Official Memoranda.

(From the Board of Trade Journal.)

IRON AND STEEL PRODUCTION IN THE UNITED STATES.

HER Majesty's Consul at Philadelphia states that changes and new enterprises in the iron trade of the United States during the past two years have been numerous. The low prices for many iron and steel products of 1888 and the first six months of 1889 did not affect the activity in the trade and the extension of facilities for the manufacture of iron and steel in all forms. The erection of blast furnaces in the Southern States, and of steel works in the Northern States, continued from month to month. In November, 1889, there were 575 blast furnaces in active operation or in process of construction. The charcoal furnaces and the anthracite furnaces are gradually decreasing, while the bituminous and coke furnaces are on the increase. The annual capacity of the 575 completed furnaces in November, 1889, was 13,168,233 net tons, and the aggregate capacity of all the blast furnaces throughout the United States at the close of 1889 is not only much larger than it was two years ago, but the average capacity is also much larger. In November, 1889, the average capacity was 22,901 net tons per annum, or 440 net tons per week.

The rolling mills and steel works are enumerated at 445 completed rolling mills and steel works in the United States, November, 1889, with 11 building. In the two years 1888 and 1889, 39 new rolling mills and steel works were built, and 27 abandoned, leaving a net gain of 12. Of the 39 new enterprises completed in the last two years many of them embraced works for the manufacture of steel by either the Bessemer or the open hearth process.

The rolling mill capacity numbered 4,914 in November, 1889; the heating furnaces numbered 2,733; the number of trains of rolls, 1,510; the annual capacity of the rolling mills in finished iron and steel, 9,215,000 tons; the number of rolling mills manufacturing cut nails and spikes was 75, with 6,066 nail machines.

The Standard Bessemer Steel Works in November, 1889, throughout the United States numbered 41, completed with 88 converters, with no new plants in course of erection. The annual ingot capacity of the completed and building Standard Bessemer Steel Works was 5,600,000 tons, Clapp-Griffiths and Robert-Bessemer plants both being excluded.

The Clapp-Griffiths steel industry in this country has made no progress in the last two years; indeed, it has slighly retrograded. In November, 1889, there were only eight completed plants, containing in all 14 converters, with an annual ingot capacity of 200,000.

The Robert-Bessemer steel process was introduced into this country within the past two years from France. It is a modification of the Bessemer process, and in November, 1889, seven completed plants were in activity, containing 11 converters, with three in course of erection, and one plant in course of erection. All converters operated by this new method are of small capacity, used in making castings and for miscellaneous purposes.

The open-hearth steel industry continues in favourable progress. In November, 1889, the number of completed open-hearth furnaces was 116, with 23 furnaces building, and a number previously built were remodelled and enlarged. The annual capacity of the open-hearth furnaces completed in November, 1889, is estimated at 1,000,000 net tons of ingots, and of the 23 furnaces then in course of erection 200,000, showing a total capacity of 1,200,000 tons, against 815,000 tons in 1887.

The Crucible Steel Works has been practically stationary for a number of years, owing to competition of steel made by other methods. In November, 1889, there were 43 completed crucible steel works, containing 3,378 pots, and three plants building to contain 150 pots.

Basic Bessemer steel has not so far been made in this country, except experimentally. In Pennsylvania two works are making very soft basic open-hearth steel.

Pig iron is now made in 24 States; rolling mills are found in 28 States and one territory; cut nails are made in 15 States; wire nails in 13; Bessemer steel in 11; Clapp-Griffiths steel in three; Robert-Bessemer steel in five; open-hearth steel in 11; crucible steel in 11; iron ore forges in five; and pig-iron scrap bloomeries in five States. Natural gas as fuel is used in 104 rolling mills and steel works, but the annual increase has been very light. During the past year there has been much interruption to its use at many iron and steel works, caused by an inadequate supply, and some manufacturers are contemplating a return to the use of coal entirely.—(*No. 731, Foreign Office Annual Series.*)

DISCOVERY OF MINERAL OIL IN INDIA.

The Calcutta *Englishman* (overland mail) for the 13th May has the following:—

"A discovery of mineral oil has recently been made in the Suliman hills in the district occupied by the Tsor Kheyl tribe of Shiranis. The story of its discovery is decidedly interesting. About five years ago,

it appears, the Rev. W. Thwaites, a missionary at Dera Ismail Khan, had in his employment a Shirani chowkedar. On one occasion when the regular house servant was away the boy undertook to trim the wall lamps for night use. The smell of the oil struck him as familiar, and he asked what oil was put into these lamps, as its smell was exactly like that of an oil that issued from the ground in his own country. He was accordingly told to get some, and in the course of a few days some oil was brought from the hills by one of his relatives. On being burned in a lamp it gave a good light, though it was somewhat darker-tinted than the ordinary kerosine procurable in the bazaar, and gave off more smoke. In the pass from whence the oil was bought there is a stream of water running between two hills, and from small springs in the ground on one side the oil issues and is collected in small holes dug in the ground. The Shiranis use it for outward application to sores on animals, and among them it goes by the name of Water of Skhormá. Attention was drawn to the fact of the existence of this oil during the Viceroy's late visit to the Gumal, and its quality has since been declared by an expert to be very good. As regards the practicability of working the oil on any large scale nothing can be said until a further examination of the locality has been made.

PERUVIAN PETROLEUM.

The *Journal de la Chambre de Commerce de Constantinople*, for the 14th June, says that the discovery of very important petroleum wells in the north of Peru, in the region comprised between Payla and Tumbes (Department of Pima), will be the means of creating a new source of prosperity for Peru. Already for several years past an Italian, M. Paggio, has been working four wells at Zorritos, near Tumbes, but the petroleum was of an inferior quality, and the refined petroleum was only sent to Lima in small quantities. An American, M. Tivield, already well-known by his works at Baku and on the Red Sea, purchased a few month ago vast deposits situated near Talara (to the south of Tumbes). Owing to the large amount of capital at his disposal, the workings have assumed considerable importance. Eight wells are at present opened, and the supply of petroleum would appear to be inexhaustible. A factory for refining the petroleum, and another for manufacturing the tin boxes, have been erected.

A joint stock company, with a capital of £200,000., has just been formed for the working of the Talara deposits, and those which may be discovered in the future. M. Tivield has ordered from the United States six fast steamers containing tanks for distributing the petroleum on the Pacific coast and even sending it to Europe. Besides kerosine, the Talara Company also exports unrefined petroleum, which is used for the heating of locomotives.

The Talara working has thus a brilliant future before it. The wells have the advantage of being situated near to the port, which is an excellent one.

REGULATIONS AS TO TESTING MINERAL OIL IN ITALY.

In a despatch to the Foreign Office, dated the 3rd June, the Marquis of Dufferin and Ava, Her Majesty's Ambassador at Rome, encloses the following translation of regulations adopted by the Italian Government, to be observed in taking samples of heavy mineral oils for chemical analysis:—

The Ministry has reason to suppose that certain Customs offices neglect the precautions suggested in rule No. 20 of the *Bollettino Officiale* of 1884 in taking samples of heavy mineral oils for chemical analysis.

In order to avoid inequality of treatment and possible claims, the Ministry lays down the following rules:—

From every consignment of heavy mineral oil the Custom house must take one or more samples, according as it may judge from the colour or other characteristics that the barrels *(fusti)* contain one single or several qualities of oil.

2. When taking two or more samples the Custom house must fix with precision the quantities, the marks, the numbers and the total weight of the barrels represented by each sample.

3. The barrels chosen for taking samples must be repeatedly shaken in such a manner that the contents shall become entirely homogeneous.

4. The samples must be taken not from the top or the bottom of the barrel, in order that every sample may represent the mass of the liquid. The same precaution must be observed in taking samples to serve as evidence to prove whether the entire consignment declared contains one single or several qualities of oil.

5. The bottles destined to contain the samples for transmission to Customs central chemical laboratory must be cleaned and well wiped or previously washed with the oil of the samples which they are to contain. The heads of the Custom houses will be careful to see that the above rules are scrupulously observed.

A NEW COCOA-NUT PRODUCT.

The *Ceylon Observer* for the 10th April, quoting from the *Ceylon Advertiser*, says:—

Paragraphs have been going the round of London and provincial journals concerning a new manufactured product of the cocoa-nut, so much the reverse of correct, and so calculated to leave a wrong impression as to the future development of the new industry, that it may be well to correct these errors.

The product to which we refer is what has been termed "cocoa-nut butter," a name which is incorrect, and is probably accountable for much of the ill-repute into which it has fallen. Being regarded as a "butter," and produced at about half the market price of ordinary butter, those who have written on the subject raise a cry condemning it as a new adulterant of the dairy produce, and a rival of margarine. In the first place, it is not a butter in any sense of the word, and is not at all likely to be employed as an adulterant by reason of its peculiar flavour and colour. It is in fact a vegetable lard, and as such it is intended to be used, and is so employed in German kitchens in all cooking processes. We are desirous of correcting the erroneous statements regarding this article, because we believe there is a great future for it in a way and in a direction which we will indicate further on. It is, moreover, worthy of notice as being one more product added to scores of others from the same remarkable tree—the cocoa-nut palm—regarding which the British public are but inadequately informed. The graceful form and bright hue of its golden fruit and feathery foliage are well enough known to most readers of illustrated botany and books on the East; but how few are acquainted with the numberless uses to which every fraction of its stem, leaves, and fruit are applied by the natives of Eastern countries! So numerous are its uses, such a blessing is the tree to the races of tropical countries, and so little is known of its original habitat, that it has been termed "a gift of the gods."

We think it necessary to remove the wrong impression created by allusion to this new article as an "adulterant," because we believe it will build up a future trade in the eastern and western worlds. Throughout India, wherever Indian coolies are found as labourers, as is the case in the West Indies, the natives of that vast country employ in their culinary operations a large quantity of fat, under the name of "ghee," answering in colour and quality to our "lard." It is the product of Buffalo milk, and inasmuch as Hindoos will not use any animal fat, the Mohammedans avoid the use of hog's lard, this ghee is the only article in use throughout India for culinary purposes, and being in such large demand it is by no means cheap when purchased in the bazaars. Now, in the newly introduced cocoa-nut fat, misnamed butter, there is at once a better and a cheaper article for Hindoo and Mussulman use. Being a purely vegetable product, it is commended to the scrupulous Hindoo and the prejudiced Mohammedan, and cannot fail to come into extensive use throughout India, and when we say this we say a great deal, because we have to deal with a population of two hundred millions. If it can be produced by German chemists at Mannheim at half the cost of butter, after incurring the charges on importing the bulky raw material from the East, how much more economy may be studied by its manufacturers in localities where the cocoa-nut is produced in such lavish abundance? The production of the nut may be indefinitely extended on the poorest soil in both the East and West Indies, offering employment and profit in our own colonies and dependencies.

WATER IN DYEING.

EVERY dyer knows that water is of great importance in dyeing, and upon its state of purity depends its fitness for such purpose. It is only in rare cases that water occurs in a state approaching chemical purity, as it usually contains more or less foreign matters, which consist either of insoluble mechanical impurities, such as sand, vegetable, animal, and other substances—present usually in small quantities—and soluble impurities. Mechanical impurities are rarely of much consequence; if, however they are so abundant as to be likely to cause spots and stains they are easily removable by filtration.

The dyer is, however, chiefly concerned with the ingredients dissolved in the water, such as lime salts, which exert a great influence on his result. Besides lime salts, magnesium salts are also of frequent occurrence and exert a similar influence; iron is rarely present, but it has a most injurious influence on most dyeing processes. Other metallic salts occur in waters more rarely; alkaline salts, such as common salt, chloride of potassium, sulphate of sodium and potassium commonly occur in most natural waters, but their influence in dyeing is *nil*. Lime salts are present in most natural waters in comparatively large quantities; they consist generally of the carbonate and sulphate, the relative proportions varying very much. Carbonate of lime (or magnesia) is insoluble in pure water, but is soluble in water containing carbonic acid, what is sometimes called the bicarbonate of lime (or magnesia) being formed. All natural waters contain carbonic acid, and such in flowing through the soil take up the carbonate of lime (or magnesia), and thus become charged more or less with that body.

Naturally the more highly charged with calcareous matter the soil is, the more lime the water will dissolve. When water, which contains the soluble carbonate of lime (or magnesia) in solution, is boiled, it loses its carbonic acid, and its solvent being gone, the carbonate is precipitated out in an insoluble form, a phenomenon familiar to every owner of boilers by the resulting formation of scale. The sulphate of lime (or magnesia) is present in all waters, but unlike the carbonate it does not lose its solubility if the water is boiled.

Lime and magnesia salts impart to water what is termed "hardness," which is of two kinds—permanent, due to the sulphate of lime and magnesia which it contains; and temporary hardness, due to the carbonates. When hard waters are used for dyeing, especially the alizarine dyes, the effect of the lime salts, especially of the carbonate, is that the dyes form with the lime coloured lakes which are deposited on the fibres in a loose condition; on washing these are washed off and the dyed fibre loses depth and brilliancy. To remedy this defect it is necessary to neutralise the carbonate of lime by adding acid to the dye bath. Acetic acid is the best to use for this purpose. The acetate of lime which is formed is readily soluble in the water and is not affected by boiling. A small excess of acetic acid is not at all injurious, as it exerts no solvent action either on the mordant or on the colour lake produced on the fibre by the dyeing process. The quantity of acetic acid to be added depends upon the quantity of carbonate of lime in the water; usually from one to two quarts for every 1,000 quarts of water used will be found sufficient.—*Textile Mercury.*

THE COMPOSITION OF FODDER.

IN the course of the year, we have analysed forty samples of the various kinds of fodder, in general use, for feeding cattle, and give the results obtained in the accompanying table.

A large number of analyses of this kind has already been published, but it is useless to multiply them, since the composition of a fodder, a pulp, or a root may vary considerably, according to the circumstances of its production. The results may also differ on account of the fact, that various methods of analysis are in use. We therefore give a short outline of the method which we have followed.

The substance is first dessicated until it can be powdered and sifted, and all the succeeding estimations are carried out on material which has been treated in this way, and preserved in stoppered bottles.

Five grammes are dried at 105°—110°, and the total moisture calculated, that lost by the preliminary drying being included.

The dry residue is calcined and treated with nitric acid, the residue being filtered off. To the clear liquid are added ammonium citrate and magnesium mixture, and it is then allowed to stand for 12 hours, the precipitate being then filtered off and washed. It is finally redissolved in nitric acid, and the phosphoric acid estimated volumetrically by uranium solution. The total nitrogen is determined by Kjeldahl's method, one to two grammes of material being employed.

The determination of the total nitrogen has hitherto been thought sufficient, but this is not the case, since we know that the nitrogen of vegetable products is not all present in the form of alimentary nitrogen, *i. e.* contained in proteid substances, but also occurs in the form of amides, nitrates, etc., in which it is not available for nutrition.

It is therefore in reality the alimentary nitrogen alone which has to be determined, in order to gain an idea as to the value of the fodder. The distinction is certainly difficult to make, and it can only be effected by a somewhat arbitrary method. However, a process, proposed by M. Sellet, does exist, and has been adopted both by M. Joulie and M. Grandeau, and which enables us, at all events, to obtain comparable results, and to detect important differences between the nutritive value of substances equally rich in total nitrogen.

We employ the method in the following manner, after having determined the total nitrogen. A solution containing 5 c.c. of pure acetic acid per litre is made, and 50 c.c. of it boiled with one gramme of the substance in a porcelain basin for five minutes. The clear liquid is decanted on to a filter, and the residue, after being twice washed with the boiling dilute acetic acid by decantation, is finally transferred to the filter. The residue is then dried and placed, along with the paper, in a flask, to be treated by Kjeldahl's method. It is supposed that in this way the proteid nitrogen alone is determined, the nitrates, etc., having been removed by the acid. The result is multiplied by 6·25 to express the amount of nitrogenous substances.

The carbohydrates (sugar, etc.) are determined by placing 2 grammes of substance in a 200 c.c. flask, with 100 c.c. of a solution containing 100 c.c. of concentrated hydrochloric acid per litre. The flask is closed by a stopper, through which a straight tube, 50 centimetres long, passes, and the solution boiled for two hours. After cooling it is made up to the mark, 1 c.c. being added to allow for the insoluble matter, and a filtered portion is then titrated with Fehling's solution. The result is expressed as amylaceous substances.

Finally the fatty matter is determined by placing 2-5 grammes of substance, mixed with 10 grammes of sand, in a tube, the lower part of which is drawn out and closed by a plug of cotton wool. The tube is then filled with ether, and corked so that the liquid can only filter very slowly through the cotton wool. The filtrate is allowed to drop into a small basin and evaporate spontaneously. Five or six washings are thus made, the time required being in all about 48 hours, and the basin is then gently warmed and weighed.

A comparison of the numbers obtained leads to several interesting results. Clover grass is richer in alimentary nitrogen than any other form of fodder. The percentage of nitrogen is greater in "diffusion pulp" than in "pressed pulp," but the difference becomes very great when the alimentary nitrogen is considered. The proportion of alimentary to non-alimentary nitrogen is 66 to 34 in pressed pulp and 92 to 8 in diffusion pulp. It will be readily understood that all the soluble nitrogenous matter would be washed out during the diffusion process, while the proteid matters, coagulated by the heat, would remain in the pulp.

The residual grain from breweries is even richer than the diffusion pulp, and for a similar reason.

If the pulp be compared with the beetroot itself it will be found that the former has a greater nutritive value, because in the root half of the nitrogen is present in a soluble form, and is not therefore of any nutritive value. The proportion of nitrogen is much greater in the leaf than in the root, but much of this is soluble, and part of it is known to be present as nitrate, a salt which is liable to produce ill effects if introduced too largely into food intended for cattle.

The amount of non-alimentary nitrogen has been found to be quite as high in the carrot.

Roots in general, therefore, appear very inferior to pulps as nutritive substances, and it must be observed that they do not contain much less water than pressed diffusion pulp.

Oats, bran, and malt grain are the richest in fats, if we except the oil cakes, which sometimes contain as much as 14%.

Saccharine and amylaceous substances are most plentiful in lentils, bran, oats, malt grain, and in beetroots and carrots, in which they are always represented by sugar; they are only present in small quantities in oil-cakes.

Finally, the foods richest in phosphoric acid are invariably oil-cake, bran, and malt grain.

	100 parts of dry material gave							
		Nitrogenous Substances.				Amylaceous and Saccharine Matter.		
	Water. Per cent.	Alimentary.	Non-alimentary.	Total.	Nitrogen.	Fats.		Phosphoric Acid.
Hay	23·52	6·86	2·29	9·15	1·46	2·09	32·14	0·36
,,	12·20	5·56	1·53	7·09	1·13	2·27	36·13	0·58
,, Clover	30·19	13·28	3·66	16·94	2·71	2·76	17·51	0·76
,, ,,	25·46	9·92	3·16	13·08	2·09	2·47	24·82	0·50
,, Lucerne	13·00	11·85	4·53	10·08	2·57	3·17	19·23	0·71
,, Sainfoin	10·44	5·37	4·40	9·77	1·56	2·63	23·96	0·68
Mixture of Field Grasses, Clover and Pulp	82·93	9·34	1·24	10·58	1·69	1·96	27·84	0·45
Straw from Oats	23·12	2·82	0·00	2·82	0·45	2·20	30·78	0·28
,, ,, Wheat	21·59	1·42	0·00	1·42	0·22	1·34	28·23	0·27
Lentils and Rye	24·16	16·52	0·46	5·98	0·95	2·08	37·98	0·47
Bran	14·06	12·22	4·07	16·29	2·60	4·47	57·20	2·51
Oats	14·64	10·00	2·78	12·78	2·04	6·09	62·58	0·76
Pressed Pulp	83·42	5·30	2·68	8·07	1·29	0·41	32·73	0·27
Pulp kept in Silo	84·30	4·40	1·76	6·16	0·98	0·40	30·42	0·17
Diffusion Pulp	89·51	7·62	0·89	8·51	1.36	0·27	36·02	0·23
,, ,,	91·39	7·61	0·44	8·05	1·28	0·47	33·21	0·15
Pulp in Silo	88·35	9·72	1·33	11·05	1·76	0·55	32·76	0·23
,, Macerated	90·98	9·33	5·77	15·10	2·41	2·48	26·03	0·48
Malt Grain	79·05	15·70	2·69	18·30	2·94	6·87	45·95	1·27
,, ,,	80·53	17·67	0·44	18·11	2·89	8·60	38·64	1·53
Grain from Distilling Maize, Rye, Barley	76·66	26·55	3·55	30·10	4·81	13·75	35·00	0·72
Beetroot Sugar	78·66	4·19	4·65	8·84	1·41	0·32	75·74	0·62
,, Red	84·44	3·61	4·50	8·11	1·29	0·64	74·40	0·51
,, Yellow	83·35	4·06	5·84	9·90	1·58	0·47	65·25	0·63
,, Leaves	89·58	9·55	6·73	16·88	2·65	2·45	12·92	0·57
Carrots	87·62	2·11	6·84	8·95	1·43	1·53	57·97	0·66
,,	88·93	2·93	9·79	12·72	2·03	1·61	59·31	0·79
Rutabagus	86·00	5·27	7·19	12·46	1·99	1·33	61·15	0·74
Leaves of do.	88·63	10·52	8·33	18·85	3·01	2·73	27 09	0·98
Cabbage leaves	87·77	—	—	16·65	2·50	5·15	5·87	0·56
Maize, entire plant	88·05	—	—	8·00	1·28	2·39	29·24	0·58
Oilcake, Linseed, La Plata	12·68	—	—	39·63	6·34	12·35	22·62	1·90
Do. Bombay	13·12	—	—	33·72	5·39	5·96	19·49	1·71
Do. Bastia	14·68	12·58	2·06	14·54	2·32	10·08	35·85	0·69
Oilcake, Cotton	14·56	—	—	31·75	5·08	2·74	11·10	2·21
,, Colza	12·06	—	—	38·56	6·16	13·90	10·37	2·16
,, Colza (foreign)	11·90	—	—	38·96	6·23	0·60	10·06	2·70
Oilcake, Arachides	11·66	—	—	47·65	7·62	10·84	19·53	1·90
Oilcake	15·80	—	—	21·82	3·49	10·22	18·36	0·91
Provender	11·80	—	—	16·26	2·60	6·98	33·09	1·58

—*L'Engrais.*

AZO-TURKEY RED.

THIS is being offered to Continental dyers, not in a prepared form the same as magenta, ready for dyeing direct on the fibre, but the materials for its production on the fibre are sent out with full instructions for use. These materials consist of napthylamine hydrochlorate and beta-naphthol. The cloths to be dyed are padded through a solution of beta-naphthol, made by dissolving 1,440 parts in 1,600 parts of soda lye of 29 per cent. strength, at about 60° Tw., and 5,760 parts of hot water; and when the naphthol is completely dissolved, 20,000 parts of water are added. The cloths after padding in this solution are dried, and are then passed into a solution made fresh as wanted as follows:—1,430 parts of beta-naphthylamine are rubbed into a smooth paste with 1,000 parts of hydrochloric acid of 32 per cent. strength, and 20,000 parts of water are added; the whole mass is boiled for 20 minutes, and then allowed to cool. Next, 2,200 parts of hydrochloric acid are added slowly and with constant stirring, and also about 8,000 parts of ice, broken up into small lumps; to the cold mass is now added 765 parts of nitrite of soda, previously dissolved in 5,000 parts of water with constant stirring. The solution so obtained is filtered rapidly, and 2,800 parts of acetate of soda and sufficient ice-cooled water as will make up the total volume of the liquor to 100,000 parts are added. The cloth prepared as above with the naphthol is entered into this bath, worked until the shade is developed, rinsed in water, soaped with a weak soap liquor, which causes it to have a bluer tone, again rinsed in water and finally dried.

A fine red is obtained, which although not quite equal to Turkey or alizarine reds in fastness, yet is very resistant to light, air, acids, and alkalies. This process appears to resemble very closely Holliday's patent for vacanceine red, which is produced similarly. We should judge that these processes of producing colour on the fibre are growing into favour on the Continent. The results are good if the processes are carefully carried out, and fast colours rivalling alizarine in fastness and brilliancy can be obtained; but in this country they seem to be neglected.—*Textile Mercury.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

Verax.—We have heard of the scheme, but are rather sceptical as to the value of the process.

A Disgusted Analyst.—Your letter, though perfectly true, is inadmissible; it is too strong, in fact, libellous.

Anxious.—Perhaps so, but we would prefer to see the material before giving an opinion.

T. H. V.—No.

*****We do not hold ourselves responsible for the opinions expressed by our correspondents.***

To the Editor of the Chemical Trade Journal.

Sir,—In your account of the visit of the Society of Chemical Industry to the Midland Railway Works at Derby, you say, referring to the work done in the laboratory: "We were, however, somewhat surprised to gather from our cicerone that brass boiler tubes, of which an enormous number are used in locomotive construction, are not analysed in this laboratory." I do not know how you came to be thus misinformed, for brass tubes, copper tubes and fire-box plates, bearing-metals, bronzes, &c., are frequently analysed.

I may perhaps take the opportunity of correcting another slight error with regard to the manufacture of railway grease. This is made in a building away from the carriage works, and which your correspondent did not see.

Yours truly,

Chemical Laboratory, Midland Railway, Derby, July 22nd, 1890.

L. Archbutt.

A New Induline Colouring Matter.—A new induline colouring matter has been discovered and patented by Meister, Lucius, and Bruning. It is a bluish violet colour, and is the hydrochloride of a basic body, having the formula $C_{24}H_{18}N_4$, and it is obtained by heating aniline, aniline hydrochloride, and amidoazobenzene. The acetate of the new induline base is obtained in the form of blue leaflets with a brown lustre. It is soluble in water, and dyes mordanted cotton. This new product is of special interest from a scientific point of view.

Trade Notes.

Sanitas.—The directors of the Sanitas Company (Limited) have resolved to declare an interim dividend at the rate of 10 per cent. per annum for the six months ended June 30, 1890, free of income-tax, payable on September 1 next.

A Waterproof Whitewash.—Resenschek, of Munich, mixes together the powder from three parts of silicious rock (quartz), three parts of broken marble and sandstone, also two parts of burned porcelain clay, with two parts of freshly slaked lime, still warm. In this way a wash is made which forms a silicate if often wetted, and becomes, after a time, almost like stone. The four constituents, mixed together, give the ground colour, to which any pigment that can be used with lime is added. It is applied quite thickly to the wall or other surface, let dry one day, and the next day frequently covered with water, which makes it waterproof. This wash can be cleansed with water without losing any of its colour; on the contrary, each time it gets harder, so that it can even be brushed, while its porosity makes it look soft. The wash, or calcimine, can be used for ordinary purposes, as well as for the finest painting. A so-called fresco surface can be prepared with it in the dry way.

Another Phosphate Scare.—The phosphate rock industry in South Carolina and Florida has been full of surprises, and the latter state is now treated to another, which is out of the usual run. The first intimation that the land of oranges contained phosphate rock influenced many persons to take advantage of the homestead law, and rich territory was generally selected in which to locate. The Government is said to have decided that phosphate territory will be classed as mineral land, and that all homestead claims must be surrendered. Since then, a wild rush has been made to take out mining claims, and the country is over-run with speculators, surveyors and adventurers. There are said to be 5,000 suits of ejectment in course of preparation, involving property valued at $10,000,000., and in which 50,000 people are directly or indirectly interested. When the excitement is over, it will no doubt be found that many persons were made victims of a well planned swindle. Sharpers have made Florida a rendezvous, and by exhibiting samples of phosphate, succeeded in selling almost worthless land at good figures. Although thousands of acres have left the possession of original owners, we hear very little about developing the territory, except by established companies who had experts on the ground, and gave the deposits a thorough test. There is considerable chaff yet to be sifted from the wheat in that region, and then Florida will settle down to promote the industry after the quiet methods pursued in South Carolina.

Cooling Water on a Large Scale.—About a year ago plans of a large iron structure which is intended to cool the water in the reservoirs with which the engines of the Paisley thread mills of J. and P. Coats are supplied, were prepared by Mr. Motion, engineer to the firm, and the work of erection has now been completed. The horse power of the engines used in the Ferguslie factory amounts in all to 10,000, necessitating a very large supply of water for condensation purposes. Owing to the overheating of that in the reservoir, which was sometimes as high as 100 degrees, an insufficient vacuum was created in the condensers, and the working of the machinery was thus hampered. By this new system, however, the temperature of the water will be much reduced, and cooled sufficiently to supply engines of an additional 2,000 h.p. The cooling frame rests on concrete piers, placed 50 feet apart in the western section of the reservoir, and is constructed of wrought iron in girder form, 635 feet long by 24 feet wide and 30 feet high. It is unequalled in this country, and unsurpassed throughout the world in magnitude. The discharge water from the whole of the engines flows into a receiving well to the east of the old canal bridge, and is forced by four double-acting pumps through a 36-inch pipe to the centre of the frame, whence it is drawn up into a receiving tank. From this it escapes, through sluice boards on each side, into troughs fitted with sprinklers, which spread the water. It then passes over stages of lathwork, and is split up into small particles, so that the air affects it thoroughly before it falls into the reservoir. An engine-house has been erected adjacent to the receiving well, and in it, with the above-mentioned pumps, are two pairs of compound inverted receiver engines, with high pressure cylinders 19 inches in diameter, and low pressure 32 inches in diameter and three feet stroke. The quantity of water dealt with is 3,000 tons per hour, and the effect of the cooling frame is to reduce it in temperature by something like 40 degrees. The total cost of the undertaking was £10,000, and the weight of the frame is 260 tons. When in operation the cooler presents a strange appearance, the whole structure being enveloped in steam, while the water is seen rushing along the top and falling through the lathwork like heavy rain.

BLEACHING AND DISINFECTING.—Messrs. Brownen and Gamgee have taken out a patent for bleaching and disinfecting clothes and other fabrics. The essential feature of their invention consists in burning bisulphide of carbon in a suitable lamp, the construction of which they do not specially describe. One of the products of combustion is sulphurous acid gas, which, as is well known, possesses bleaching and disinfecting properties. The gas so produced is conducted into large chambers, fitted with shelves on which the articles to be bleached or disinfected are placed, these shelves being so arranged as to cause the gas to pass through the chamber in a zig-zag direction. The clothes, etc., are moistened before they are put on the shelves, where they absorb the gas and are gradually bleached; afterwards they are rinsed in water or soap and water to complete the cleansing. According to the inventors this process is applicable to a great many purposes, bleaching fabrics, disinfecting clothes, preservation of meat, purification of sewage, sterilization and bleaching of hops, etc. As the combustion of carbon bisulphide in lamps has been already in use, the patent would appear to be valid only so far as relates to the use of chambers with shelves.

INDIGO PRINTING.—Some improvements in indigo printing have been patented by Messrs. Hulme and Walton. They prepare a solution of indigo as follows: A solution of bisulphite of soda is saturated with zinc, and then ground indigo is added in the proportion of 1 lb. of indigo to 1 pint of the solution. When the indigo is dissolved, there are added three pounds of caustic soda, and as much more zinc as it will take up. Such, at least, is the description in the provisional specification. According to the complete specification, the method of preparing the solution is rather different—1 lb. of indigo ground in water is taken, and 3 lb. of caustic soda are stirred in, until the soda is dissolved, when 1¾ lbs. of zinc powder is added by degrees. When this zinc is dissolved, more caustic is added, until the yellow solution retains its colour when exposed for five minutes, then more soda and gum is added to form a gummy paste. With the solution so obtained cloth is printed. The printed cloth is exposed to the air to oxidise the indigo; the cloth is passed through water tanks, and exposed to the air until the blue is fully developed, when it is soaped and dried. By padding the cloth in a dilute solution of the above colour, and printing on the colour, dark blue patterns on pale blue grounds can be produced. In neither the complete specification, nor in their claims is the use of bisulphite of soda referred to, although, as noted above, it is the solvent agent used in the process described in the provisional specification.

Market Reports.

REPORT ON MANURE MATERIAL.

Prices of both nitrogenous and phosphatic material continue very firm, but there seems to be less disposition to buy than there was a few weeks ago.

There is no change in the position of mineral phosphates. There is a moderate business doing at last quotations, and we have not heard that the advanced prices demanded for Charleston have been paid.

£5. 10s. required for cargoes of River Plate bones, which price buyers will not at present give, though £5. 7s. 6d. could no doubt be obtained.

There is nothing fresh in East Indian bones, shippers refusing meantime to offer. Nominal value of crushed Kurrachees is £5. 5s., ex quay. Spot value of East Indian bone meal is £5. 10s., ex store, but for shipment ahead 2s. 6d. to 5s. per ton more would probably have to be paid. Common grinding bones are worth about £4. 17s. 6d. ex quay Liverpool.

Owing to further rumours of disturbances on the West Coast, there has been more excitement in the nitrate market, and a good many cargoes have changed hands during the week at a slight advance. The spot value is about 8s. 4½d. per cwt., and due cargoes are worth 8s. 3d. to 8s. 4½d., delivered U.K. ports, according to size. September-October shipments could not probably now be bought under 8s. 9d.

There has been some further business done in home prepared dried blood, but prices not reported. Nothing fresh in ammonite.

TAR AND AMMONIA PRODUCTS.

The benzol market retains its firm character, and, though 3s. 10d. for 90s. and 2s. 10d. for 50/90s. is quoted in some quarters, still there is no doubt the actual value is nearer 4s. and 2s. 11d. Solvent naphtha is still firm, but creosote has given way slightly. Crude carbolic acid has not improved, but, while buyers are offering 1s. 10d., sellers are not anxious to part with their makes under 2s. Anthracence remains as before. The pitch market is weak; at this time of the year business is in a state of stagnation, and efforts are being made to bring prices to a lower level. To-day's value may be quoted as 25s. to 26s. 6d. on west and east coast respectively. Some makers are expecting a heavy fall, but this is not the general impression.

The sulphate of ammonia market is quiet, chiefly produced by the absence of demand from the Continent. It is difficult to say what actual values are, as Hull is quoted from £11. 6s. 3d. to £11. 10s., and Leith £11. 5s. to £11. 6s. 3d., while Beckton remains nominal at £11. 12s. 6d. London outside makes are quoted at £11. 7s. 6d. to £11. 8s. 9d., but as few actual transactions have been reported these figures may mean extreme values. The absence of demand from abroad makes it rather difficult to get shipping instructions in certain quarters, but the general feeling is that if makers will offer as little as possible the prices of to-day will be maintained.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron is steady and demand shows some improvement. Price of Scotch closes about 45s. 6d. cash, and 45s. 8½d. one month, at which there is more disposition to do business. Manufactured iron is in better demand at steady rates; Middlesbrough warrants 43s. cash, and Hematite warrants at 52s. 9d. cash and 52s. 10½d. one month. Copper is firmer: Chili bars, G.O.B.'s and G.M.B.'s closing at £57. 17s. 6d. to £58. 5s. cash and £58. 10s. to £58. 17s. 6d. three months. Sulphate of copper remains quite nominal and demand for the moment is very slow. In copper shares Rio Tinto rose ⅛ to 22$\frac{15}{16}$, and Copiapo $\frac{1}{16}$ to 3. Tin quiet; Straits £94. 5s. closing £94. 7s. 6d. cash, £94. 7s. 6d. the 11th August, and £94. 15s. three months; Australian £94. 10s. cash; English ingots £98. Spelter firm, Silesian ordinary £23. 5s. Lead, more enquiry, Spanish £12. 15s.; English £13. Quicksilver £10. 3s. second hands. Tinplates are firm with small business doing.

GLASGOW, WEDNESDAY.—Market easier with a fair business. Scotch done at 45s. 8½d., 45s. 7½d., 45s. 8d., and 45s. 7d. cash, also at 45s. 9½d., 45s. 9d., 45s. 10½d., and 45s. 9d. one month; closing buyers at 45s. 6d. cash, sellers ask 1½d. more. Middlesbrough done at 43s. cash and one month; closing buyers at 42s. 10½d. cash, sellers ask 43s. Hematite done at 53s. 1½d. to 52s. 10½d. cash, also at 53s. 4½d. to 52s. 10½d. one month; closing buyers at 52s. 9d. cash.

WOLVERHAMPTON, WEDNESDAY.—The improved reports from Middlesbrough and Glasgow continue to have a good effect upon the Staffordshire iron trade. A better demand is springing up for several classes both of crude and finished iron, and altogether things are healthier. The report brought on 'Change this afternoon showed that marked bars were selling at £8., and common at £6. 12s. 6d. and upwards. Hoops are in better call for America at £7. 10s. Sheet iron is quoted at £7. for singles. Cold blast all-mine pig iron is selling better at £5.

MISCELLANEOUS CHEMICAL MARKET.

The position of all products of the alkali trade is decidedly firmer, both for prompt and forward delivery. Bleaching powder is moving off freely at £5. 10s. to £5. 15s. per ton on rails at makers' works. In export packages, £5. 17s. 6d. to £6. f.o.b. Liverpool and Tyne. Caustic soda also improved: prices firm at £10. per ton f.o.b. for 70%, and other strengths at corresponding prices. Soda ash steady at 1¼ per deg. f.o.b. Soda crystals £2. 15s. Salt cake in bulk 30s. per ton. Recovered sulphur £4. 2s. 6d. per ton. Muriatic acid 7d. per carboy. Vitriol 145°, 24s. per ton, all on rails at makers' works. Chlorate of potash is in a firmer position, and is now quoted 5d. per lb., though some resales still on the market at 4¼d. to 4⅜d. Oxalic acid quiet at 3½d. to 3¾d. net per lb. Brown acetate of lime is finding an outlet at the lower prices, business being done at £7. 5s. to £7. 7s. 6d. at usual points. Grey slightly lower at £12. 10s. to £12. 15s. c.i.f. Acetate of soda rather dearer at £16. to £16. 10. c.i.f. Acetic acids (commercial qualites) are selling readily at 7s. per cwt. for 25%. Arsenic firm at £13. 5s. nett at usual points. Muriate of ammonia quiet and rather easier in price for prompt delivery. Salammoniac in good demand, and makers are clear of stocks. Potash, caustic and carbonate are steadily maintained in price, and there is a good demand from the consumers. Carbolic acid crystal is steady, and makers are holding firmly at 7½d. to 8d. for 34/35°, and 8½d. to 9d. for 39/40°. Liquid carbolic and cresylic acids are moving off at 1s. 1d. to 1s. 3d. per gal., according to quality. Lead salts are steady in price, and more enquired for. Tin crystals 6½d. to 6¾d. per lb.

THE LIVERPOOL MINERAL MARKET.

Minerals have ruled pretty brisk during the week, and prices remain practically without alteration. Manganese: Arrivals have been below the average. The demand has been good, but prices are unaltered. Magnesite: Further large arrivals of lump, which can be bought at almost any price; raw ground, £6. 10s., and calcined ground, £10. to £11. Bauxite (Irish Hill brand) continues in strong request, whilst prices are firm: Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: Arrivals this week are nil. A large business has been doing on spot, which has materially reduced stocks, and prices remain firm, especially for G.G.B. "Angel White" brand, 95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate): Whilst there is an improved demand, the output has kept pace with it, and prices are unchanged; selected crystal lump is scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; and selected crystal ground, £8. Sulphate firm, and prices are better; best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.G.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumice-stone quieter; ground at £10., and specially selected lump, finest quality, £13. Iron ore steady. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore easier. Spanish manganiferous ore in fair demand. Emerystone: Best qualities in demand at full prices. No. 1 lump is quoted £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal continue to be enquired for. Chrome metal, 5s. 6d. per lb. Chrome ore best qualities offering freely, and prices easier. Antimony oxide, 24s. to 26s. Asbestos is in strong demand, especially rock; prices firmer. Potter's lead ore continues firm; powdered, £15. 10s.; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Best qualities are scarce, 60s. to 80s. Strontia steady; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Bog ore in demand, firm, at 22s. to 25s. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, continues scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel more doing. Chrome iron unaltered at last quotations. Ground mica, £50. China clay freely offering—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn).

THE LIVERPOOL COLOUR MARKET.

Colours were steady. Ochres: Oxfordshire has been quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc: V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

There is still a strong and generally advancing market, but the manufacture in and around Glasgow has been suspended during the past few days, owing to the celebration of the annual holidays of the operatives, and the usual indications as to exact values are, therefore, for the moment wanting. All the city offices are resuming to-day, and by Thursday most of the works will have reopened. The effort to set up an authoritative "Conciliation Board" within the Scottish paper making industry is again to the front, the object being to bind the interests of masters and men within one common administrative bond towards the warding off of destructive labour quarrels; but some of the largest masters look on the project with pronounced dislike, and its realisation is not very promising at the moment. The Scottish paraffin manufacturers are to have an early meeting to decide on the price of burning oil for another year, and it is feared that there must be a drop if the article is to retain a footing on the market, so weakly has been its condition for the past six months. This is a grave matter, for till now the industry depended chiefly on this particular product for its ability to return dividends, and, the margin being narrow, even a very small drop might extinguish that ability altogether. Fortunately, the other paraffin products are all very healthy, but there is no certainty as to duration. Since the reduction, orders on the Scotch makers of bichromates have considerably improved in bulk. Chief prices current are:—Soda crystals, 52s. 6d., net Tyne; alum in lump £5., less 2½% Glasgow; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; soda ash, 1¼d. less 2½%, Tyne; caustic soda, white, 76°, £12., 70/72°, £9. 15s., 60/62°, £8. 15s., and cream, 60/62°, £8. all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s., and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1½d., less 1¼%, Tyne; saltcake, 31s. 6d. to 32s.; bleaching powder, £5. 10s. to £6. 2s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5 and 6% to Scotch and English buyers respectively (for export these prices net); chlorate of potash, 4⅞d. to 5d., less 5% any port; nitrate of soda 8s. 3d. to 8s. 4½d.; sulphate of ammonia, £11. 6s. 3d. to £11. 7s. 6d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 5% Liverpool; sulphate of copper, £18. 10s., less 2½% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3¼d.; paraffin spirit (naphtha), 7d. a gallon; paraffin oil (burning), 6¾d. to 7d. on rails Glasgow to all Scotch buyers (English orders negotiable about 1¼d. a gallon lower); ditto (lubricating), 865°, £5. to £5. 10s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock, *nil.*

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market here continues strong and firm, with upward tendency in prices. A good deal of business is being transacted, buyers being anxious to cover, owing to the favourable progress made in the formation of the Chemical Union. Bleaching powder has again advanced in price, and for prompt delivery is 2s. 6d. to 5s. per ton dearer than last week, but the increase is greater still for forward deliveries. Soda crystals are in good demand, and about 2s. 6d. per ton better. Soda ash has also improved by two-and-a-half per cent. There is no change in the price of caustic soda, but market continues firm. Sulphate of soda quiet, and little doing at the moment.

The following are to-day's quotations:—Bleaching powder, in soft-wood casks, £5. 7s. 6d. to £5. 10s. per ton for prompt shipment, and £6. per ton asked for August-September delivery; caustic soda, 77%, £10. 10s. per ton; ground and packed in 3-4 cwt. barrels, £13. 10s. per ton; soda ash, 48/52%, 1¼d. per degree, net; soda crystals, £2. 12s. 6d. to £2. 15s. per ton, in casks; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5d. per lb., less 6% discount; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hypo-sulphite of soda, in 1 cwt. kegs, £5. 15s. per ton; in 5-7 cwt. casks, £5. 5s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

Small coals for manufacturing purposes continue fairly steady. Northumberland steam small firm at 6s. 6d. to 7s. per ton, and Durham small from 7s. to 7s. 6d. per ton, according to quality.

New Companies.

SHEPPY PORTLAND CEMENT COMPANY, LIMITED.—This company was registered on the 14th inst., with a capital of £14,000., in £10. shares, 600 of which are £6. per cent preference shares, to carry on the business of cement and lime manufacturers in all branches, and for such purposes to adopt an unregistered agreement of 16th ult., with George Gibbens. The subscribers are:—

	Shares.
E. W. Gaffray, 13th Hussars, Edinbro'	1
C. F. Cole, Warlingham, Surrey	1
G. Gibbens, 181, Queen Victoria-street, barge owner	1
H. B. Walmsley, 13, York-buildings, Adelphi, pottery manager	1
J. Kenrick, 5, New-inn, solicitor	1
H. H. de Buisson, 5, New-inn, solicitor	1
G. H. Gibbens, Norwood-road, Herne-hill, clerk	1

AMARANTH BITTERS AND FININGS COMPANY, LIMITED.—This company was registered on the 12th inst., with a capital of £66,000., in £1. shares, whereof 25,000 are 6 per cent. cumulative preference shares, 40,000 are ordinary shares, and 1,000 are deferred shares. The company proposes to purchase, upon terms of an unregistered agreement of 7th inst., the interests of A. Savigear and Thos. Scrutton in certain preparations called "Amaranth Bitters," "Beer Finings," "Wine Fining," and "Limo Pepsine." The subscribers are :—

	Shares.
Col. J. W. Knollys, 42, Grafton-road, W.	1
W. H. Castle, 22, Upper Phillimore-gardens	1
T. J. Scrutton, 4, Spencer-villas, East Putney	1
A. Savigear, 36, Barkston-gardens, Earl's-court-road	1
W. O. Rew, 59, New Broad-street, solicitor	1
F G. Salamann, C.A., 7, Queen Victoria-street	1
W. C. Gordon, 2, Curzon-street, Mayfair	1

BLACKMAN VENTILATING COMPANY, LIMITED.—This company was registered on the 10th inst., with a capital of £75,000., in £1. shares, to purchase from the liquidators of the Blackman Air Propellor Ventilating Company, Limited, the patent rights, property, and effects of that company, and also to acquire and work the business, letters patent, and inventions of Isaac D. Smead, of Toledo, Ohio, U.S.A. The subscribers are :—

	Shares.
Col. J. T. Griffin, Netherhall-gardens, Hampstead	1
Hy. Wright, Chetwynd House, Hampton Court	1
Major-General H. Greene, 93, Belgrave-road	1
M. Shillito, 6, Bramshill-gardens, N.W.	1
G. C. Sutton, 52, Maddox-street, W.	1
A. Tibbitts, Goldhurst-terrace, South Hampstead	1
H. L. Pring, Elm-villa, Richmond-hill, accountant	1

GREENFIELD MILL COMPANY, LIMITED.—This company was registered on the 11th inst., with a capital of £10,000., in £50. shares, to carry on business as bleachers and dyers, manufacturers of waste for gun cotton, and other purposes, bleaching and dyeing materials. The subscribers are :—

	Shares.
N. Buckley, Droylsden, cotton spinner	1
A. Buckley, Ashton-under-Lyne, cotton spinner	1
W. H. Buckley, Ashton-under-Lyne, cotton waste dealer	1
J. Ashworth, Dukinfield, hat manufacturer	1
R. Redford, Greenfield, near Oldham, hat manufacturer	1
J. Green, Ashton-under-Lyne, cashier	1
H. Haigh, Greenfield, engineer	1

JOHN BENNET LAWES AND COMPANY, LIMITED.—This company was registered on the 10th inst., with a capital of £80,000., in £100. shares, to acquire the business of chemical manufacturer, carried on by Sir John Bennett Lawes, Bart, at 29, Mincing-lane, and at the Atlas Works, Millwall. The subscribers are :—

	Shares.
Sir J. Bennett Lawes, Bart., St. Alban's	1
Thomas Bennett, 21, Mincing-lane, managing clerk	1
G. F. Berry, Atlas Chemical Works, Milwall, factory manager	1
T. A. Wilson, 57, Coleman-street, solicitors' managing clerk	1
Lady Lawes, St. Alban's	1
Mrs. W. P. Creyke, 3, Seamore-place, Mayfair	1
C. B. Lawes, Studio, Chelsea-bridge, sculptor	1

J. GRAYSON LOWOOD AND COMPANY, LIMITED.—This company was registered on the 10th inst., with a capital of £100,000., in £10. shares, to acquire certain manufacturing and other business now carried on by John Grayson Lowood, and also certain leasehold lands, works, &c., situate in Attercliffe-road, Sheffield, at Deepcar, near Sheffield, and at Middlesbro'-on-Tees, and certain colliery, ganister, and fire-clay mines, at or near Deepcar. The subscribers are :—

	Shares.
J. G. Lowood, Five Oaks, Sheffield, manufacturer of fire resisting goods	1
Sir H. E. Watson, Sheffield	1
C. B. Stuart Wortley, M.P., 10, Victoria-square, S.W.	1
G. M. Hutton, Gainsbro'	1
G. A. Winder, Pitsmoor, Sheffield	1
F. G. Dalton, Clarendon-villas, Sheffield	1
J. J. Pickford, Nether Edge, Sheffield	1

LUCAS SOAP SYNDICATE, LIMITED.—This company was registered on the 15th inst., with a capital of £6,000., in £1. shares, to purchase the interest of Mr. George Allen, of 51, Milton-street, in Lucas' Soaps. The subscribers are :—

	Shares.
Henry Adams, 7, Fore-street-avenue, merchant	1
T. Cox, 54, Holborn-viaduct, merchant	1
F. Deans, 18, Waldegrave-road, Hornsey	1
F. Baker, 99, Turnpike-road, Hornsey, corn chandler	1
F. C. Bluman, 45, Upper Kyverdale-road, Stamford-hill	1
S. A. Gooch, 51, Milton-street, hosiery manufacturer	1
H. E. Case, 9 and 11, Moor-lane, clerk	1

VINIOSO ANTIMONY SYNDICATE, LIMITED.—This syndicate was registered on the 15th inst., with a capital of £7,070., divided into 1,400 ordinary shares of £5. each, and 70 founders' shares of £1. each, to acquire an antimony property known as the Ribeira de Macas, situate at Grolheiro, parish of Algosa and Campo de Vobrora, Vinioso, district of Braganca, Portugal. The subscribers are :—

	Shares.
J. D. Pattulo, 30, St. Swithin's-lane, secretary of companies	1
C. Adams, 70, Hotham-street, Stratford, clerk	1
J. A. Wilkie, 22, Richmond-crescent, Barnsbury, clerk	1
E. W. Lyons, 4, Scarbro'-road, Stroud-green, clerk	1
M. Manes, 188, Cornwall-road, Notting Hill, W., clerk	1
H. M. Bentley, Muswell-hill, secretary	1
E. A. Crowe, 4, Eastcheap, merchant	1

WHITE SOFT SOAP COMPANY, LIMITED —This company was registered on the 14th inst, with a capital of £3,000., divided into 285 ordinary shares of £5 each, and 63 7 per cent. preference shares of £25. each, to carry on business as soap manufacturers, and to acquire patents for improving and producing white soft soap. An agreement of the 30th ult., with Miles Williams, will be adopted. The subscribers are :—

	Shares.
W. Constable, 2, Robert-street, Liverpool, secretary	1
F. E. Walker, Aughton, brewer	1
T. J. Rushton, Bootle, accountant	1
H. Griffith, 6, Goree, Liverpool, chain and anchor merchant	1
H. W. Garner, Anfield, Liverpool	1
J. H. Shaw, C A., 4, Harrington-street, Liverpool	1
C. Beasley, 13, Rumford-street, Liverpool, salesman	1

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Centrifugal Machines. J. Sellars. 10,461. July 7.
Bottle Making Machinery. D. Rylands and D. Stoner. 10,462. July 7.
Basic Blue Colouring Matters. J. Dawson and R. Hirsch. 10,470. July 7.
Artificial Indigo. J. Y. Johnson. 10 509. July 7.
Reduction of Ores. C. G. Cunningham. 10,510. July 7.
Treatment of Fibrous Plants. E. Dezwarte and the General Financial and Industrial Corporation, Ltd. 10,517. July 7.
Evaporating Apparatus. T Gaunt and E. H. Clapp. 10,524. July 8.
Liquid Electrodes. E. S. D'Odiardi and A. Thompson. 10,530. July 8.
Re-converting Residuary Cyanides. C. J. Ellis and A. Dicker. 10,537. July 8.
Automatic Supply of Air to Furnaces. E. Holt. 10,539. July 8.
Improved Water Gauge Glasses. E. George and J. Dykes 10,542. July 8.
Gas Reversing Valve for Regenerative Furnaces. J. Jardine. 10,551. July 8.
Apparatus for Drying and Mixing Bones. A. H. Hobson. 10,562. July 8.
Improved Process for Sterilising Milk. F. A. Raedler. 10,563. July 8.
Rendering Wood, etc., Incombustible. A. D. Lasker. 10,589. July 8.
Improved Process for Extracting Oil from Seeds. L. Roumieu. 10,590. July 8.
Heating Gaseous Liquid and Solid Substances. M. Honigmann. 10,592. July 8.
Apparatus for Measuring Electrical Energy.—(Complete Specification). E. Thomson. 10,595. July 8.
Improvements in Water Meters.—(Complete Specification). H. H. Lake. 10,597. July 8.
Colouring Matters. H. H. Lake. 10,599. July 8.
Manufacture of Basic Slag. J. E. Stead. 10,625. July 9.
Feed-water Heater.—(Complete Specification). F. H. Ashbury. 10,645. July 9.
Impregnating Liquids with Gases. E. Fabrig. 10,679. July 9.
Cocks for Mixing Gas and Air. R. Goehde. 10,698. July 10.
Apparatus for Raising or Forcing Liquids. A. Bruce. 10,700. July 10.
Leather Substitute. S. Thorn. 10,706. July 10.
Utilizing Waste Products from Smelting. G. A. Herdman. 10,711. July 10.
Charging Inclined Gas Retorts. W. Bugby. 10,713. July 10.
Improvements in Prime Movers. A. Collingridge. 10,717. July 10.
Charging Kilns, Furnaces, etc. W. L. Wise. 10,721. July 10.
Compound for Crucibles. W. A. Carlyle. 10,724. July 10.
Manufacture of Salt. A. P. J. Archbold. 10,737. July 10.
Treatment of Varnish Oils. A. F. St.George. 10,753. July 11.
Lime Sifter. L. Posgate. 10,764. July 11.
Recovering Tin from Tin-plate. A. McDougall. 10,783. July 11.
Hydro-extractors. H. M. Saint-Denis. 10,788. July 11.
Concentration of Sulphuric Acid. H. J. Haddan. 10,790. July 11.
Colouring Matters. O. Imray. 10,802. July 11.
Impregnating Porous Bodies. B. J. B. Mills. July 11.
Charging Inclined Gas Retorts. L. Van Vestrant. 10,831. July 12.
Application of Antiseptics to Beer, etc. A. Boake and F. G. A. Roberts. 10,845. July 12.
Manufacture of Glass Tubing. D. Rylands and R. Morant. 10,847. July 12.
Steam Water Heaters. W. Matthews, J. Yates, and W. Yates. 10,851. July 12.
Carbonizing Apparatus.—(Complete Specification). A. Silverberg and C. Detering. 10,856. July 12.
Metallic Coverings for Electric Wires. J. M. M. Munro. 10,857. July 12.
Electric Meters.—(Complete Specification). E de Pass. 10,868. July 12.
Charging Gas Retorts. G. F. Priestley. 10,869. July 12.
Boiler Gauge Glasses. S. Green. 10,885. July 12.
Drying Apparatus. J. H. R. Dinsmore. 10,888. July 12.
Manufacture of Caustic Soda. F. Ellershausen. 10,906. July 12.
do. Sulphide of Sodium. F. Ellerhausen. 10,910. July 12.
Preparation of Malt. H. H. Lake. 10,915. July 12.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

RAMSBOTTOM AND NEILD, Manchester, and elsewhere, paper manufacturers.

J. JAMES, C. B. HARCOURT, AND W. OTTLEY, under the style of T. James and Co, Kidderminster, paper manufacturers.

R. DRESSER AND M. FALKARD, under the style of Rd. Dresser, Falkard, and Co., York, chemists, and aërated water manufacturers, as far as regards R. Dresser.

G. CHADWICK AND G. J. BOOTH, under the style of G. Chadwick and Co., Bury tanners.

F. W. BOND, C. C. TURNBULL, J. MORRISON, AND H. A. WATSON, under the style of Vivian, Younger and Bond, Birmingham, and under the style of Vivian, Bond and Watson, Liverpool, metal merchants, as far as regards C. C. Turnbull.

F. W. BOND, J. MORRISON, AND H. A. WATSON, under the style of Vivian, Younger and Bond, Birmingham, and under the style of Vivian, Bond, and Watson, Liverpool.

F. W. BOND, J. H. ROGERS, J. BOURNE, H. C. BOND, C. C. TURNBULL, AND J. MORRISON, under the style of Swansea Tin Plate Co., Swansea, tin and terne plate manufacturers, as far as regards C. C. Turnbull.

F. W. BOND, C. C. TURNBULL, AND J. MORRISON, under the style of Vivian, Younger, and Bond, Leadenhall St., City, metal brokers and merchants, as far as regards C. C. Turnbull.

F. J. W. POLGLASE, AND J. T. SMITH, under the style of Polglase, Smith & Co., Newcastle-upon-Tyne, manufacturing chemists.

RIDDLE AND HARDEN, Manchester, size, tallow, glue, soap, and bone manure manufacturers.

IMPORTS OF CHEMICAL PRODUCTS

LONDON.

Week ending July 12th.

Alkali—
Holland, 600 c. Taylor, Sommerville & Co.
,, 400 E. Olyett & Sons

Acetate of Lime—
U. S., 259 pks. Lister & Biggs

Acetic Acid—
Holland, 100 pks. Beresford & Co.
,, 10 H. Lorenz
,, 3 A. & M. Zimmermann

Alum—
Holland, £250 Ohlenschlager Bros.
,, 150 ,, ,,

Antimony Ore—
France, 21 t. Pillow, Jones & Co.
Germany, 3 L. & I. D. Jt. Co.
New Zealand, 5 Major & Field
Portugal, 80 H. Emanuel
Spain, 20 ,,
Pt. Douglas, 3 F. Manders
Singapore, 10 Pillow, Jones & Co.
New Zealand, 30 N. Z. Antimony Co.

Bones—
France, 5 t. R. Morrison & Co.
U. S., 9 T. Ronaldson & Co.
Melbourne, 2 Goad, Rigg & Co
Brisbane, 2 ,, ,,
,, 11 ,, Leach & Co.
Melbourne, 20 Culverwell, Brooks & Co.

Barytes--
Holland, 22 cks. W. Harrison & Co.
,, 82 Magee, Taylor & Co.
,, 21 H. Hodson & Co.
Belgium, 31 bgs. W. Harrison & Co.
Germany, 20 cks. J. Dickinson & Co. Ltd.
Belgium, 16 W. Harrison & Co.
,, 100 bgs. Colthurst & Harding
Germany, 18 cks. O'Hara & Hoar
,, 69 D. Storer & Sons, Ltd.
,, 22 W. Harrison & Co.

Boracic Acid—
Holland, 10 pks. Ross & Deering
Germany, 2 L. & I. D. Jt. Co.

Borax—
Germany, £26 F. Stahlschmidt & Co.

Caustic Potash—
France, 42 pks. J. Knight & Sons
Holland, 22 Petri Bros.

Cream of Tartar—
France, 7 pks. C. F. Gerbardt
,, 1 pkg. E. W. Carling & Co.

Caoutchouc—
Inhambane, 58 c. W. M. Smith & Sons
Zanzibar, 15 Anderson, Weber & Smith
Madagascar, 37 Kebbel, Son & Co.
France, 7 Matheson & Co.
Zanzibar, 168 A. Cheney & Co.
U. S., 24 L. & I. D. Jt. Co.
,, 9 Kebbel, Son & Co.
Portugal, 570 L. & I. D. Jt. Co.
Germany, 31 H. Kiver & Co.
Cape Town, 98 L. & I. D. Jt. Co.
France, 10 Flageollet & Co.
Mauritius, 9 A. Cheney & Co.
Zanzibar, 16 Clarke & Smith
,, 8 L. & I. D. Jt. Co.
E. Indies, 44 Petrocochino Bros.
Madagascar, 144 Kebbel, Son & Co.
Zanzibar, 52 L. & I. D. Jt. Co.
Aden, 9 Ide & Christie
E. Indies, 176 Ralli Bros.
Rangoon, 388 L. & I. D. Jt. Co.
France, 6 Flageollet
,, 14 Hernn, Peron & Co.
,, 5 Matheson & Co.
E. Indies, 138 Kebbel, Son & Co.
,, 137 Arracan Co.
,, 44 L. & I. D. Jt. Co.
Inhambane, 9 ,,

Copper Ore—
Rockhampton, 7 t. Wrightson & Son

Chemicals *(otherwise undescribed)*
Germany, £127 Craven & Co.
,, 120 T. H. Lee
,, 500 A. & M. Zimmermann
,, 112 W. Burton & Sons
Holland, 15 Barr, Muering & Co.
Germany, 70 Phillipps & Graves
France, 12 C. Brumlen
Germany, 500 A. & M. Zimmermann
Holland, 20 Phillipps & Graves
,, 25 J. Sauer
,, 21 Hernn, Peron & Co.

Chemicals—*continued*
Germany, 53 T. H. Lee
,, 675 A. & M. Zimmermann
,, 12 Phillipps & Graves
,, 16 L. & I. D. Jt. Co.

Dyestuffs—
Gambier
Singapore, 92 pks. Elkan & Co.
Logwood
Jamaica, 15 t. Anderson, Anderson & Co.
France, 165 A. Hagan
San Domingo, 65 Churchill & Sim
Tanners' Bark
Holland, 21 t. S. Barrow & Bros.
Melbourne, 93 Baxter & Hoare
,, 9 Culverwell, Brooks & Co.
Sydney, 36 Flack, Chandler & Co.
Melbourne, 99 Baxter & Hoare
,, 309 ,, ,,
,, 48 ,, Leach & Co.
,, 100 A. & W. Nesbitt
,, 296 Elkan & Co.
U.S., 24 A. J. Humphrey
Adelaide, 100 Devitt & Hett
Aniline
Holland, 9 pks. Magee, Taylor & Co.
Indigo
E. Indies, 8 chts. J. Owen
,, 2 L. & I. D. Jt. Co.
,, 4 Schenker & Co.
,, 39 L. & I. D. Jt. Co.
,, 2 Darling Bros.
,, 10 Langstaff & Co.
,, 10 F. W. Heilgers
,, 61 Stansburg & Co.
,, 11 cs. G. W. Wheatley & Co.
,, 51 chts. F. W. Heilgers & Co.
,, 36 Arbuthnot, Latham & Co.
,, 63 L. & I. D. Jt. Co.
,, 30 Benecke, Souchay & Co.
,, 4 Arbuthnot, Latham & Co.
,, 22 G. S. N. Co.
Divi Divi
E. Indies, 14 pks. Colombo Coml. Co.
Spain, 248 R. M. S. P. Co.
Extracts
Holland, 12 pks. T. H. Lee
,, 100 B. Kuhn
France, 20 T. H. Lee
Austria, 10 M. D. Co.
Holland, 100 B. Kuhn
Germany, 435 A. J. Humphrey
France, 5 J. Burnett & Sons
U.S., 25 J. Graves
,, 400 T. Ronaldson & Co.
Sumac
Italy, 100 pks. Beresford & Co.
Myrabolams
E. Indies, 1,571 pks. A. Hagan
,, 2,190 Marshall & French
,, 683 Benecke Souchay & Co.
,, 2,770 Hoare Wilson & Co.
Orchella
E. Indies, 7 bls. Hoare Wilson & Co.
Cutch
Rangoon, 200 pks. Anderson Fairley & Co.
E. Indies, 200 R. G. Hall & Co.
Fustic
Jamaica, 5 t. Anderson Anderson & Co.
Colon, 18 Churchill & Sim
Spain, 4 ,,
Jamaica, 41 P. Macfadyen & Co.
,, 3 S. Dobree & Sons
Dyestuffs *(otherwise undescribed)*
Holland, 42 pks. Burt Boulton & Co.

Glucose—
Belgium, 89 pks. 30 cwts. J. Barber & Co.
Germany, 500 500 ,,
,, 26 226 Prop. Chamberlain's Wf.
,, 100 100 J. Barber & Co.
U. S., 250 1420 Union Lighterage Co., Ld.
Germany, 12 72 M. D. Co.
,, 100 100 R. D. Drummond & Co.
France, 31 100 Carey & Sons
,, 400 400 Trier Mayer & Co.
Germany, 25 220 Horne & Co.
,, 18 40 Spies Bros. & Co.
,, 100 100 M. D. Co.
,, 62 531 L. Sutro & Co.
U. S., 800 800 A. Dawson

Glucose—*continued.*
France, 10 10 Carey & Sons
Germany, 500 500 T. C. Howell
,, 200 200 Baxter & Hoare
,, 13 110 A. Lorenz
,, 1,000 1,000 R. D. Drummond & Co.
,, 30 239 L. Sutro & Co.
U. S., 150 1,200 T. M. Duche & Sons
,, 50 275 Union Lighterage Co., Ld.
,, 400 400 Barrett Tagent & Co.

Gutta Percha—
Singapore, 125 c. Kaltenbach & Schmitz
,, 20 G. Ward & Sons

Glycerine—
Holland, £70 F. W. Heilgers & Co.
Germany, 15 Beresford & Co.
Holland, 540 Spies Bros. & Co.

Isinglass—
Singapore, 5 pks. L. & I. D. Jt. Co.
,, 42 H. H. Blow & Co.
N. Russia, 1 Magee Taylor & Co.
,, 1 M. D. Co.
France, 12 H. Gluck & Co.
E. Indies, 9 Hale & Son
,, 3 Forbes, Forbes & Co.

Manure—
Holland, 110 t. London M're Co., Ltd.
France, 180 T. Farmer & Co.
,, 38 ,,
Holland, 75 Lawes Manure Co, Ld
France, 165 Anglo-Contl. Guano Wks.
,, 191 ,,
Phosphate Rock
U. S., 2,150 t. Fox Ray & Co.
Aruba, 353 G. M. Bauer

Naphtha—
Holland, 8 drs. Domeier & Co.
,, 88 Burt Boulton & Co

Potashes—
Montreal, 80 c. Charles & Fox

Potash Salts—
Germany, £50 F. Farmer & Co.

Potassium Carbonate—
Germany, 17 pks. Beresford & Co.
,, 6 ,,
,, 41 E. Cook & Co.
France, 10 J. A. Reid

Paraffin Wax—
U. S., 94 brls. Rose, Wilson & Co.
,, 469 J. H. Usmar & Co.
,, 75 Mordaunt Bros.
,, 90 cs. H. Hill & Sons

Plumbago—
Germany, 17 cks. Prop. Scott's Wf.
E. Indies, 207 brls. Prop. Chmbln.s Wf.
China, 80 Union Lighterage Co.
Germany, 20 cks. Brown & Elmslie
E. Indies, 557 brls. J. Thredder Son & Co.

Pearl Ashes—
France, 200 c. Petri Bros.
Holland, 120 T. H. Lee

Pyrites—
La Laja, 450 t. G. Ward & Sons

Pitch—
France, 70 cks. H. Hill & Sons
Spain, 72 C. B. Leighton
Sweden, 5 brls. G. Meyer & Co.

Potassium Sulphate—
Germany, 508 pks. Anglo-Contl. G. Works

Saltpetre—
Germany, 65 cks. J. Hall & Sons.
,, 100 T. Merry & Son
E. Indies, 291 bgs. L. & I. D. Jt. Co.

Sugar of Lead—
Germany, 31 pks. Hyslop & Symonds
,, 16 Beresford & Co.

Sodium Acetate—
France, 10 pks. Prop. Hay's Wf.

Soda Ashes—
Holland, 204 c. Henderson Craig & Co.

Tartaric Acid—
Holland, 20 pks. B. & F. Wf. Co.
,, 16 ,,

Ultramarine—
Belgium, 6 cks. Leach & Co.
Germany, 4 G. Steinhoff

Zinc Oxide—
Holland, 200 pks. M. Ashby, Ld.
Germany, 50 brls. ,,
,, 50 cks. J. Matton
Holland, 300 Soundy & Son
,, 15 Beresford & Co.
Germany, 50 brls. M. Ashby Ld.

LIVERPOOL.

Week ending July 15th.

Acetate of Lime—
St. Nazaire, 84 sks.

Acetic Acid—
Rouen, 2 cks. R. J. Francis & Co.

Borax—
Rouen, 21 cks. ,,
Valparaiso, 640 bgs.

Bones—
Valparaiso, 58 bgs.

Boracic Acid—
Leghorn, 30 cks. Shropshire Union Co.
,, 96
Hamburg, 6

Cream of Tartar—
Barcelona, 5 bds.
Bordeaux, 3 cks.
Barcelona, 7 Sachse & Klemm

Copper Ore—
Montreal, 105 brls. Archer Baker

Caoutchouc—
Ambriz, 2 cks. Taylor, Laughland & Co.
Kinsembo, 1 ,,
,, 1 Jaffe & Sons
Mussera, 7 Taylor, Laughland, & Co.
Ambrizette, 2 ,,
,, 6 J. Holt & Co
Muculla, 2 ,,
Cabenda, 8 Hatton & Cookson
Black Point, 2 bgs. Edwards Bros.
,, 2 Pinto, Leite, & Nephew
Loango, 2 Edwards Bros.
Mayumba, 16 Hatton & Cookson
Nyanza, 5 ,,
Sette Cama, 33 ,,
,, 32 J. Holt & Co.
Gaboon, 14 cks. A. V. Heyder
Cameroons, 3 Rider, Son, & Co.
,, 11 R. & W. King
,, 12 J. Holt & Co.
,, 5 A. Herschell
,, 1 Lucas, Bros., & Co.
Victoria, 1 Ambas Bay Co.
Old Calabar, 24 African Association
,, 1 c 1 1 kg.
Quittah, 12 W. J. Rodatz & Co.
Accra, 19 J. P. Werner
Sierra Leone, 4 brls. Pickering & Berthoud
Pernambuco, 12
Maranham, 1 Gunston, Son, & Co.
C. C. Castle, 4 A. Miller, Bros., & Co.
,, 1 Taylor, Laughland, & Co
,, 2 Ihlers & Bell
,, 2 W. Duff & Co.
,, 1 1 cs. W. Griffiths & Co.
,, 1 L. Hart & Co.
,, 5 H. B. W. Russell
,, 7 1 Pickering & Berth'd
,, 1 Edwards Bros.
,, 1 S. & C. Nordlinger
,, 4 Davies, Robbins, & Co.
,, 1 Howard & Co.
,, 1 L. Jones & Co.
,, 2 1 cs. Mordant Bros.
,, 2 J. Smith
,, 5 Fletcher & Fraser
,, 14 4
Axim, 1 bg. A. Millerson & Co.
,, 1 Radcliffe & Durant
,, 1 Pickering & Berthoud
Para, 132 cs. R. Singlehurst & Co.
,, 58 W. Carden & Co.
,, 110

Chemicals *(otherwise undescribed)*
Rotterdam, 17 cks.

Dyestuffs—
Madders
Rotterdam, 2 cks.
Sumac
Palermo, 525 bgs.
,, 950
Catania, 25 30 bls.
Extracts
New York, 20 bls.
Divi Divi
Catania, 1 bg.
Bombay, 86
Valonia
Smyrna, 255½ t. Barry Bros.
,, 100 230 bgs.
Fustic
Pernambuco, 1,870 kilos.
Cochineal
Santa Cruz, 17 bgs. A. Valgury
Gr. Canary, 4 Swanston & Co.
Orchella
Lisbon, 50 bgs Mertlen & Co.
Logwood
Laguna de Terminos, 360 t. V. G. Oriot

Argols
Patras, 9 brls. M. D. Frangopulo
,, 6 Cursi, Raptopulo & Co.
Glucose—
Hamburg, 90 cks.
Philadelphia, 40 brls.
Rouen, 5
New York, 545
Glycerine—
Hamburg, 1 drm.
Rotterdam, 5 cs.
Venice 20
Horn Piths—
B. Ayres, a quantity Williamson, Milligan, & Co.
Iodine—
Valparaiso, 21 brls. San Sebastian Nitrate Co.
,, 284 A. Gibbs & Sons
Isinglass—
Maranham, 9 brls. Gunston, Son, & Co.
Para, 6 cs. Bieber & Co.
,, 10 Hooton & Yates
Manganese—
Odessa, 630 t. G. G. Blackwell
Potash—
Montreal, 26 brls. C. H. Cunningham
Rouen, 103 cks. 21 drms. Co-op. W'sale Society, Limited
Paraffin Wax—
New York, 90 brls. H. Hill & Sons
Pitch—
Bordeaux, 36 cks.
Phosphate—
Brussels, 172 t.
Antwerp, 240
Pyrites—
Huelva, 1,135 t. Matheson & Co.
,, 1 556 ,, ,,
,, 1,630 ,, ,,
,, 1,640 ,, ,,
,, 1,509 Tennants & Co.
,, 1,430 Matheson & Co.
Salammoniac—
Hamburg, 1 ck.
Saltpetre—
Hamburg, 54 cks.
Rotterdam, 135 bgs.
Hamburg, 100 cks.
Sugar of Lead—
Hamburg, 1 ck.
Stearine—
Baltimore, 100 tcs.
Boston, 522 brls.
Sodium Phosphate—
Rotterdam, 16 cks.
Sulphur—
Kurrachee, 10 brls. W'sale. Drug Co.
Catania. 100 bgs.
Salicylic Acid—
Hamburg, 5 cs.
Salt—
Monrovia, 150 bgs.
Sulphur Ore—
Huelva, 1,137 t. Matheson & Co.
Tartar—
Valparaiso, 18 sks. Bates, Stokes & Co.
Bordeaux, 3 cks.
Tartaric Acid—
Rotterdam, 8 cks.
,, 2
Verdigris—
Bordeaux, 4 cks. 5 cs.
Zinc Ashes—
Rotterdam, 26 cks.
Zinc Oxide—
Antwerp, 398 brls.

GRIMSBY.

Week ending July 12th.

Albumen—
Hamburg, 13 pks.
Chemicals *(otherwise undescribed)*
Hamburg, 3 pks.
Glucose—
Hamburg, 12 cks.
Pitch—
Dieppe, 5 cks.

HULL.

Week ending July 17th.

Acid *(otherwise undescribed)*
Rotterdam, 3 cks. J. Lawson & Sons
Alumina—
Rotterdam, 82 cks. W. & C. L. Ringrose
Albumen—
Gothenburg, 19 cks. Wilson Sons & Co.
Barytes—
Rotterdam, 20 brls G. Lawson & Sons
,, 9 cks. ,,
Chemicals *(otherwise undescribed)*
Rotterdam, 1 ck. W. & C. L. Ringrose
Dunkirk, 142 pks. Wilson Sons & Co.
Rotterdam, 5 W. & C. L. Ringrose
Dyestuffs—
Myrabolams
Bombay, 616 bgs.
Alizarine
Rotterdam, 23 pks. W. & C. L. Ringrose
,, 18 cks. ,,
,, 70 ,,
,, 1 1 cs. Hutchinson & Son
,, 29
,, 14 pks. W. & C. L. Ringrose
,, 56 cks. Hutchinson & Son
Rennett
Copenhagen, 1 ck. Wilson Sons & Co.
Rotterdam, 4 W. & C. L. Ringrose
Glucose—
New York, 50 brls.
Hamburg, 15 cks. Woodhouse & Co.
,, 15 Rawson & Robinson
Dunkirk, 40 bgs.
Stettin, 1,200 C. M. Lofthouse & Co.
,, 10 cks. Wilson Sons & Co.
Hamburg, 25 cks. Rawson & Robinson
Rotterdam, 40 bgs. G. Lawson & Sons
Muriate—
Rotterdam, 11 cks. W. & C. L. Ringrose
Manure—
Rouen, 9 cks. Rawson & Robinson
Oxide—
Rotterdam, 5 cks. G. Lawson & Sons
Phosphate—
Ghent, 160 t. Wilson Sons & Co.
Potash—
Rotterdam, 10 cks. W. & C L. Ringrose
Pitch—
Danzig, 48 cks.
Tartaric—
Rotterdam, 8 cks. W. & C. L. Ringrose
Tar—
Drontheim, 98 brls.
Turpentine—
Danzig, 52 brls.
Zinc Oxide—
Rotterdam, 10 cks. G. Lawson & Sons

GLASGOW.

Week ending July 17th.

Acetate of Chrome—
Rotterdam, 1 brl. J. Rankine & Son
Barytes—
Rotterdam, 118 cks.
Cream of Tartar—
Tarragona, 5 cks.
Copper Ore—
Huelva, 1,540 t. Tharsis Co.
Dyestuffs—
Madders
Nantes, 5 cks.
Extracts
Antwerp, 2 cs.
Alizarine
Amsterdam, 19 cks. 1 cs.
Glucose—
New York, 97 brls.
Paraffin Wax—
New York, 500 brls. H. Hill & Son
Potassium Carbonate—
Hamburg, 14 cks.
Potash—
Hamburg, 9 cks.
Potassium Muriate—
Harburg, 200 t. Eglinton Chemical Co.
Saltpetre—
Hamburg, 5 kgs.
Tartar—
Nantes, 13 crates
Tartaric Acid—
Rotterdam, 2 cks. J. Rankine & Son
Ultramarine—
Antwerp, 20 cs.
Rotterdam, 6 cks. J. Rankine & Son
Waste Salt—
Hamburg, 130 t.
Zinc Oxide—
Antwerp, 32 brls.

TYNE.

Week ending July 16th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.
Copper Precipitate—
Huelva, 8,220 bgs. Rio Tinto Co.
Glucose—
Hamburg, 11 cks. Tyne S. S. Co.
Pitch—
Archangel, 300 cks.
Sulphur—
Drontheim, 650 t. R. S. Story & Co.
Tar—
Archangel, 1,280 brls.
Ultramarine—
Rotterdam, 2 cks. Tyne S. S. Co.

GOOLE.

Week ending July 9th.

Alum—
Rotterdam, 16 cks.
Antimony—
Boulogne, 2 cks.
Alumina Sulphate—
Antwerp, 40 cks.
Caoutchouc—
Boulogne, 1 cs.
,, 5 cks.
Dyestuffs—
Alizarine
Rotterdam, 21 cks. 8 brls.
Logwood
Belize, 318 t.
Jamaica, 430
Belize, 402
Jamaica, 600
Hayti, 400
Madder
Rouen. 1 ck.
Extracts
Rouen, 50 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 76 cks. 9 cs. 1 carboy.
,, 23
Glucose—
Hamburg, 140 bgs.
,, 300 35 cks. 47 cks.
Dunkirk, 160
Naphthylamine—
Rotterdam, 1 ck.
Potash—
Dunkirk, 21 drums 22 cks.
,, 25 8
Calais, 33 14 brls.
Potassium Muriate—
Rotterdam, 17 cks.
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 3 cks.
Sodium Silicate—
Rotterdam, 1 ck.
Tartaric Acid—
Rotterdam, 1 ck.
Waste Salt—
Hamburg, 284 t. 650 brls.
,, 426

EXPORTS OF CHEMICAL PRODUCTS

OF

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending July 9th.

Ammonium Sulphate—

Cologne,	14 t.		£155
Barbadoes,	50	2 c.	601
Hamburg,	50	15	620
Teneriffe,	5	10	31
Marseilles,	52	4	600
Genoa,	19	8	215

Ammonium Carbonate—

Yokohama,	10 cs.		£21
Bordeaux,	1 t.	14 c.	51
Paris,	3	14	112

Ammonium Nitrate—

Sydney,	9 t.	7 c.	£675

Benzoic Acid—
New York, 3 cs. £46

Boracic Acid—
Melbourne, 1 t. 8 c. £54

Carbolic Acid—
Yokohama, 5 cs. £29
Brisbane, 15 12 drs. 74

Carbolic Solid—
Hamburg, 2½ c. £10

Copper Sulphate—
M. Video, 1 t. 17¼ c. £43
,, 1 24
Treport, 4 1 120
Lisbon, 5 13 112

Caustic Potash—
Napier, 12 c. £29

Citric Acid—
Hamburg, 2 kgs. 5 c. £49
M. Video, 1½ 11
Amsterdam, 5 35
Genoa, 5 37
,, 33
Rotterdam, 4 27

Citric Acid—*continued.*
Melbourne, 40 cks. 262
Cape Town, ¾ 5
Singapore, 2 15

Cream of Tartar—
Lyttleton, 1 t. £100
Rockhampton, 5 cs. 27
Auckland, 2 t. 1 c. 210
Launceston, 5 28
,, 10 54
Melbourne, 1 110

Caustic Soda—
Natal, 4 t. 10 c. £89
,, 10 cs. 39
Napier, 9 21
Adelaide, 15 t. 5 131
Taganrog, 70 4 690
Sydney, 1 7 23
Brisbane, 12 37

Coal Products—
Pitch
Rotterdam, 70 brls. £200

Pitch—*continued.*
Antwerp, 124 t. 167
,, 641 941
Venice, 1,498 2,325
Odessa, 750 brls. 188
New York, 10 cs. 20
Tar
Bombay, 52 rlts. £47
Archangel, 100 brls. 55
Natal, 150 drms. 12
Sydney, 400 100
Bombay, 30 48
Naphthaline
Le Treport, 52 cks. £38
Philadelphia, 68 97
Stettin, 29 sks. 45
Hamburg, 23 123
Benzole
Rotterdam, 20 cks. £350
Terneuzen, 32 drs. 666
Rotterdam, 24 115
Calais, 39 783
Rotterdam, 26 pns. 30 830

Carbolic Acid
Bilbao, 20 cs. £31
Genoa, 10 sks. 17
Montreal, 5 25
Hamburg, 2 drs. 18
Anthracene
Rotterdam, 62 cks. £473
Dusseldorf, 148 1,111
Rotterdam, 30 350
Green Oil
Gothenburg, 200 brls. £100
Creosote
New York, 500 brls. £225

Chemicals *(otherwise undescribed)*
Madrid, 11 c. £85

Disinfectants—
Bombay, 12 t. 1 c. £108
Melbourne, 40 cks. 24

Insect Powder—
Algoa Bay, 3 c. £28

Manure—
Hamburg, 150 t. £1,875
Dunkirk, 32 400
Stolprinude, 275 1,150
Canterbury, 80 487
St. Lucia, 40 2 c. 431
Barbadoes, 185 1,925
Antigua, 12 120
St. Kitts, 40 400
Riga, 432 12 1,351
Mauritius, 45 18 640
Motril, 189 1 1,667
Libau, 480 1,476
Martinique, 25 12 275
Mauritius, 74 16 371
Demerara, 40 480
Bordeaux, 20 90
Rouen, 10 45

Muriatic Acid—
Cape Town, 11 c. £11

Nitric Acid—
Cape Town, 4 c. £7

Organic Salts—
Sydney, 2 t. 3 c. £185

Oxalic Acid—
Antwerp, 6 t. 9 c. £177
New York, 5 3 190
Lisbon, 12 18

Phosphorus—
M. Video, 16 c. £70

Potassium Chlorate—
Calcutta, 6 c. £12
Sydney, 5 t. 211
Oporto, 2 95
Vigo, 1 42

Pyrogalic Acid—
Sydney, 3 cs. £32

Pearl Ash—
Sydney, 7 pks. £72

Potash—
Sydney, 1 t. 3 c. £29

Superphosphate—
Canterbury, 50 t. £219
Timaru, 100 344
Lyttleton, 100 344
Mauritius, 20 2 c. 116
Barbadoes, 15 45

Saltpetre—
Oporto, 3 t. 14 c. £77
Melbourne, 1 5 27
Santos, 5 18 133

Soda Crystals—
Napier, 4 t. 18 c. £15
Hong Kong, 9 15 30

Sulphur Flowers—
Cape Town, 6 t. 14 c. £70
Adelaide, 12 10 112

Sheep Dip—
Natal, 500 drs. £101
" 22 cs. 52
E. London, 1 t. 10 c. 81
" 162 cs. 710 drs. 722
Geelong, 250 690
Pt. Elizabeth, 4,900 gls. 475
E. London, 26 cs. 75
Algoa Bay, 6 t. 19 c. 130
Pt. Elizabeth, 3 4 1,050

Sulphur—
Mackay, 3 t. 2 c. £20

Sodium Sulphate—
Ghent, 65 t £65

Sodium Hyposulphite—
Adelaide, 16 t. 9 c. £92

Sulphuric Acid—
Cape Town, 65 pks. £42
" 17 c. 13

Saltcake—
Melbourne, 17 t. 14 c. £57

Sodium Bicarbonate—
Sydney, 11 c. £12

Tartaric Acid—
Canterbury, 3 kgs. £20
Lyttleton, 3 c. 20
Montreal, 8 53
Jaffa, 2 20
Canterbury, 7 55
Launceston, 3 21

LIVERPOOL.

Week ending July 12th.

Ammonium Carbonate—
Barcelona, 6 c. £10
Genoa, 9 1 q. 13
Nantes, 3 t. 10 100

Antimony Regulus—
Rotterdam, 1 t. 11 c. £108

Albumen—
Lisbon, 4 c. 1 q. £16

Alkali—
Palermo, 2 t. 17 c. 1 q. £64

Alum—
Callao, 7 t. 4 c. £40
Constantinople, 4 8 1 q. 22
Melbourne, 4 9 22
Valencia, 2 1 10
Valparaiso, 1 6
Brisbane, 10 5
Talcahuano, 1 11 1 9

Ammonium Sulphate—
Valencia, 214 t. 16 c. 3 q. £2,724
New York, 100 8 3 1,145
Bordeaux, 10 1 2 131
Valencia, 50 11 657
Gr Canary, 28 3 2 329
New York, 51 6 3 607
Valencia, 50 7 2 549
" 49 6 1 574
Gr. Canary, 4 19 3 59
Las Palmas, 25 10 246
New York, 50 10 606
Philadelphia, 101 1,212
Antwerp, 30 360
Barcelona, 25 300

Alum Cake—
Oporto, 4 t. 18 c. 3 q £15

Ammonium Muriate—
Melbourne, 12 c. £20

Brimstone—
Calcutta, 3 t. 13 c. 1 q. £20

Boracic Acid—
Genoa, 1 t. 4 c. 2 q. £42

Borax—
Rotterdam, 55 t. 3 c. 2 q. £189
Adelaide, 1 2 32
Port Alegre, 1 brl. 5
Cadiz, 4 6

Bleaching Powder—
Ancona, 15 cks.
Bombay, 34
Boston, 212 tcs.
Havre, 25
Rouen, 185
Santander, 13
Antwerp, 28 brls.
Barcelona, 40
Bilbao, 17
Bombay, 10 cs.
Bordeaux, 161
Boston, 227
Callao, 4
Genoa, 101
Hamburg, 29
Kingsey, 24
Malaga, 30
Manilla 40 kgs.
Melbourne, 31
Montreal, 81
Nantes, 38 20
Naples, 86
New York, 171
Odessa, 19

Caustic Soda—
Antwerp, 46 dms.
Boston, 199
Cape Town, 30
Fiume, 40
Genoa, 130
Ghent, 23
Hamburg, 50
Havana, 50
Hiogo, 250
Lisbon, 15 brls.
Malaga, 12 50 kgs.
Melbourne, 18
Monrovia, 5
Monte Video, 150
Montreal, 30 cks.
Naples, 10
New York, 400

Caustic Soda—*continued.*
Odessa, 50 dms.
Oporto, 10
Rio Grande du Sol, 25 dms.
Rouen, 92 9 cks.
Santos, 20
Savanilla, 50 kgs.
Seville, 100 50 brls.
Sydney, 109
Yokohama, 350
Amsterdam, 237
Antwerp, 60
Barcelona, 301 cks.
Bilbao, 111
Carthagena, 28 brls.
Galatz, 50
Genoa, 35
Leghorn, 50
Manaos, 5
Messina, 80
Nantes, 84
New York, 150
Odessa, 200
Para, 12
Philadelphia, 100
Puerto Cabello, 10
Rio Grande du Sol, 50
Rio Janeiro, 15
Rosario, 15
Rotterdam, 83
St. Petersburg, 1,588
Savanilla, 4 cs.
Seville, 210
Vera Cruz, 300

Carbolic Acid—
Montreal, 2 c. 1 q. £12
Rotterdam, 4 22
" 2 8
Hamburg, 10 2 54
Montreal, 1 t. 2 98
New York, 2 109
Philadelphia, 1 t. 7 c. 365

Carbolic Solid—
Danzig, 12 c. £60
Barcelona, 6 3 q. 50

Caustic Potash—
Cartagena, 2 c. £7
Chicago, 10 t. 11 109

Charcoal—
Hamburg, 50 t. 1 c. 1 q. £250
" 152 13 3 763
" 29 10 144

Copper Sulphate—
Bordeaux, 17 t. 19 c. 3 q. £350
Antwerp, 5 1 110
Bordeaux, 15 320
Hamburg, 2 5 1 40
Leghorn, 35 2 683
Marseilles, 19 16 2 444
Montreal, 2 2 1 45
Galatz, 1 20
Naples, 1 4 1 21
Leghorn, 3 53
Venice, 5 1 3 90
Nantes, 11 8 281
Odessa, 4 2 83
Valparaiso, 5 118
Ancona, 15 18 289
Antwerp, 5 1 1 100
Brindisi, 10 2 216
Bordeaux, 91 6 1 1,858
Bordeaux, 11 6 1 271
Marseilles, 15 2 1 263
Cadiz, 10 12
Piræus, 18 20
Marseilles, 120 6 1 2,526
Constantinople, 4 8 1 22
Genoa, 2 1 41
Melbourne, 5 107
Rouen, 4 17 102
Bilbao, 4 18 1 101
Bordeaux, 135 9 2 2,871
Calcutta, 2 10 51
Leghorn, 5 2 118
Bordeaux, 84 17 1,772
Rosario, 14 3 10
Leghorn, 4 18 3 115
Genoa, 9 8 2 171
Marseilles, 40 3 834
Venice, 3 10 3 65

Copperas—
Syra, 4 t. 9 c. 1 q. £7
Piræus, 2 12 5
Rio de Janeiro, 13 brls. 5
San Sebastian, 4 9

Chemicals *(otherwise undescribed)*
Bombay, 5 c. £5

Dried Blood—
Montreal, 2 t. £50

Disinfectants—
New York, 6 cs. 75
Colon, 150 drums 71

Epsom Salts—
Rio de Janeiro, 50 kgs.
" 50

Guano—
Hamburg, 14 t. 18 c. £64
Nantes, 5 7 3 q. 19

Gypsum—
New York, 9 t. 12 c. 2 q. £28

Glycerine—
Antwerp, 25 t. £1,140

Iron Oxide—
Philadelphia, 3 t. 10 c. £75

Lime Muriate—
Sydney, 15 t. £32

Manure—
Barbadoes, 38 t. £316

Magnesia—
Vigo, 1 cs.

Magnesium Calcide—
New York, 144 lbs. £144

Magnesium Carbonate—
Vera Cruz, 3 cs. £6

Magnesium Chlorate—
Nantes, 10 t. 11 c. £30
Bombay, 8 12 30

Oxalic Acid—
Antwerp, 5 c. £139
New York, 3 t. 2 q. 200
" 2 5 2 109

Potassium Carbonate—
Chicago, 5 t. 16 c. £89

Phosphate—
Hamburg, 28 t. 8 c. £135

Pitch—
Vigo, 46 cks.
New York, 29 t. 1 c.

Picric Acid—
Para, 1 c. £7

Postassium Chlorate—
Antwerp, 1 t. £50
Hamburg. 10 c. 22
St. Petersburg, 2 10 108
Bari, 2 15 115
Philadelphia, 5 217
Bari, 1 47
Genoa, 3 130
Odessa, 1 56
St. Petersburg, 21 10 903
Stockholm, 5 110

Potashes—
Bahia, 5 c. 1 q. £6
Ghent, 4 t. 96
Palermo, 2 17 2 66

Potassium Bichromate—
Piræus, 5 c. £20
Venice, 10 19
Antwerp, 20 t. 3 2 q. 505

Sodium Chlorate—
New York, 5 t. £268
Boston, 2 10 c. 137
Rotterdam, 10 27

Salt—
Adelaide, 100 t.
Baltimore, 349
Barbadoes, 100
Black Point, 10
Boston, 100
Brass, 200 bgs.
Callao, 5
Cape Coast, 71
Chicago, 100
Faroe Islands, 278
Ghent, 270
Manaos, 17 17 c.
Monte Video, 45 10
Newcastle, 300
Randerstown, 200
St. Johns, 708 10
Saltpond, 25
Sydney, 3 3
Vigo, 2
Wellington, 300
Adelaide, 20
Akassa, 400
Amsterdam, 80
Antwerp, 500 100 cs.
Baltimore, 1,750
Cameroons, 60
Cleveland, 200
Georgetown, 500
Manaos, 70½
New Calabar, 800 6 c.
New Orleans, 250
Old Calabar, 236
Philadelphia, 65
Rio Janeiro, 1 12
Rotterdam, 124
St. Vincent, 6¼
Sandheads, 2,300
Santos, 100 cs.
Sydney, 325
Trinidad, 8
Cavalla, 15

Soda Ash—
Alicante, 1½ t.
Barcelona, 12 cks.
Bilbao, 70 brls.
Boston, 744 bgs. 29 tcs.
B. Ayres, 100
Lisbon, 35
Monte Video, 50
New York, 575
Valleyfield, 14
Windsor, 91
Barcelona, 70
Ancona, 5 cks.
Baltimore, 273 108
Bordeaux, 169
Brisbane, 119
" 100
Cartagena, 2
Constantinople, 100
Kingsey, 13
Malta, 10
Maranham, 125
Montreal, 17
Naples, 6
New York, 1,289
Philadelphia, 59
Puerto Cabello, 12
Rio Janerio, 45
Santos, 30
Vigo, 2 2
Bordeaux, 840 bgs.
Oporto, 13 cks.

Sodium Bicarbonate—
Amsterdam, 30 cks.
Bombay, 450
Callao, 12 kgs.
Genoa, 69
Halifax, 25
Hamburg, 20
Melbourne, 100
Montreal, 350
Odessa, 300
Rotterdam, 20
Rouen, 75
Toronto, 200
Alexandretta, 16
Alexandria, 16
Antwerp, 18
Bremen, 76
Brisbane, 25
Callao, 60
Constantinople, 100
Genoa, 125
Halifax, 50
Hamburg, 130 16
Melbourne, 20
Nantes, 10 brls.
Naples, 100 2
Palermo, 40
Rotterdam, 65
Trieste, 105 8
Trinidad, 20
Vigo, 2 2

Soda Crystals—
B. Ayres, 50 cks.
Constantinople, 30 brls.
Monte Video, 25
New York, 280
Oporto, 33
Philadelphia, 280
Boston, 280
Calcutta, 30

Sodium Silicate—
Genoa, 100 brls.
Messina, 10
Vigo, 6
Ibrail, 15
Naples, 9
Oporto, 10
Wellington, 8

Sodium Biborate—
Antwerp, 10 c. 1 q. £15
Hamburg, 6 t. 8 1 192

Salt Cake—
Para, 2 t. £6

Sodium Bichromate—
Piræus, 2 t. £57

Salammoniac—
Leghorn, 14 c. 3 q. £27
Marseilles, 2 t. 2 3 68
Alexandria, 1 36
Malta, 9 7
Beyrout, 1 11 56
Genoa, 1 13 1 56

Sulphur—
Boston, 121 t. 2 c. £660
New Pork, 50 218
Havre, 8 8 53
Halifax, 30 128

Saltpetre—
Montreal, 2 t. £44
Maranham, 11 c. 1 q. 13

Sheep Dip—
Monte Video, 30 drs. £71

Sodium Acetate—
New York, 5 t. £80

Superphosphate—
Riga, 599 t. 19 c. 2 q. £2,039

Sodium Nitrate—
Gijon, 11 c. £5
New York, 1 t. 7 35
Ancona, 2 12 1 q. 21
" 1 3 3 11

Tar—
Sierra Leone, 10 brls.
" 12

Tartaric Acid—
Callao, 3 c. £33
Vigo, 2 14

GLASGOW.

Week ending July 17th.

Ammonium Sulphate—
Trinidad, 10¾ t. £130
Demerara, 39 4 c. 420
New York, 102 8 1,125
Christiania, 59 bgs. 60

Bleaching Powder—
Hong Kong, 240 c. £114

Caustic Soda—
Marahu, 5 t. £44

Dyestuffs—
Logwood
Oporto, 16 t. 5 c. £130
Montreal, 443½ £153
Extracts
Montreal, 54 c. £75

Epsom Salts—
Sydney, £23

Glucose—
Cape Town, 6 t. 12¾ c. £120

Manure—
Demerara, 20 t. 2¼ c. £231

Naphtha—
Havre, £190

Paraffin Wax—
Nantes, 11¾ c. £25
Havre, 4 t. 100
Barcelona, 12 4¼ 360
Cape Town, 8 ¼ 294
Malta, 13 22
Odessa, 10 3½ 320
Antwerp, 15 10¾ 444

Potassium Prussiate—
New York, 4 t. 17 c. £350
" 2 18 200
Italy, 2 8½ 190

Potassium Bichromate—
Rotterdam, 5 cks. £70
Amsterdam, 13 183
Rotterdam, 15 200
Italy, 123¼ c. 225
" 2 t. 8 85
Barcelona, 286¼ 530
Christiania, 3 cks. 40

Pitch—
Penang, 10 t. 10 c. £44
Oporto, 200 250

Sodium Bichromate—
Rotterdam, 1 ck. £8
Italy, 822¾ c. 1,146
Barcelona, 50¾ 100
Antwerp, 11 t. 2 303

Soda Ash—
Hong Kong, 85¼ c. £27

Sulphuric Acid—
Marahu, 5½ t. £53

Tar—
Penang, 26 t. 11 c. £125

Turpentine—
Sydney, 200 glns. £31

TYNE.

Week ending July 16th.

Arsenic—
Christiania, 1 t. 2 c.
St. Petersburg, 5 t. 3 c.

Alkali—
Christiania, 5 t. 6 c.
New York, 108 12
St. Petersburg, 87 t. 6 c.
Amsterdam, 31 9
Rotterdam, 1 1
Amsterdam, 10 3

Antimony—
New York, 45 t.
" 45
Rotterdam, 2

Anthracene—
Rotterdam, 11 t. 18 c.

Bleaching Powder—
Gothenburg, 10 t. 10 c.
Antwerp, 45 11
Hamburg, 5 14
" 7 9
Christiania, 2 6
Rouen, 53
Newfairwater, 10 2
Danzig, 19
Norokoping, 49 13
Lisbon, 15 5
New York, 134
" 48 18
Passages, 31 3
St. Petersburg, 100 5
" 6 4
New York, 50 4
Stockholm, 11
Gefle, 1 6
St. Petersburg, 94 19
Amsterdam, 28 10
Rotterdam, 15 11

Barytes Carbonate—
Rouen, 25 t.
New York, 50
Libau, 5

Barytes—
Danzig, 5 t.

Copperas—
Christiania, 5 t. 10 c.
Montreal, 11 11

Caustic Soda—
St. Petersburg, 108 t. 19 c.
Gefle, 2 10
Rotterdam, 20
Hamburg, 8 14
Rouen, 14 15
Danzig, 10 3
Montreal, 4 12
" 10 3
New York, 104 17

Gypsum—
New York, 39 t. 3 c.

Hyposulphite—
Amsterdam, 14 c.

Litharge—
Stockholm, 10 c.
" 3 t. 3
Montreal, 5 4
Lisbon, 2 3

Manure—
Hamburg, 50 t. 8 c.

Magnesia—
Antwerp, 2 q.
Rouen, 7 c.

Oxalic Acid—
New York, 15 t. 3 c.
" 10 7

Potassium Chlorate—
St. Petersburg, 20 t.
Rotterdam, 1
Antwerp, 4 19
Hamburg, 11

Salammoniac—
St. Petersburg, 5 t. 10 c.

Soda—
St. Petersburg, 25 t. 13 c.
Archangel, 1 1
Stockholm, 5 18
Gefle, 11 17
Aalborg, 33 12
Drontheim, 5
Odense, 39
Rotterdam, 22 12
Aarhuus, 14 1
Bandholm, 11 6
Karrebebsminde, 13 8
Randers, 19 8
Montreal, 10
New York, 100

Soda Ash—
Libau, 9 t. 7 c.
Stockholm, 100 6
Gefle, 5 6
Rotterdam, 3 5
Gothenburg, 30 7
Hamburg, 9 12
Christiania, 3 10
" 3 5
Newfairwater, 114 13
Lisbon, 9 14
Christiania, 15 4

Superphosphate—
Helsingborg, 700 t.
" 382 1 c.
Memel, 400

Sodium—
St. Petersburg, 1 cs.

Sodium Chlorate—
Hamburg, 5 t.

Tar—
Archangel, 2 t. 9 c.

GOOLE.

Week ending July 9th.

Benzole—
Ghent, 16 drums
Rotterdam, 263 cks.

Copper Precipitate—
Rotterdam, 245 cks.

Chemicals *(otherwise undescribed)*
Dunkirk, 2 cks.
Ghent, 12
Hamburg, 57
Rotterdam, 25

Dyestuffs *(otherwise undescribed)*
Boulogne, 3 cs. 2 cks. 3 drums
Hamburg, 1 ck.
" 133 bgs.

Manure—
Dunkirk, 178 bgs.

GRIMSBY.

Week ending July 12th.

Coal Products—
Dieppe, 167 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 4 pks.
Dieppe, 187 cks.
Hamburg, 16
" 10 pks.

Tar—
Gefle, 5 brls.

HULL.

Week ending July 15th.

Alkali—
Constantinople, 50 cks.
Christiania, 30 kgs.
Odessa, 77 cks.

Borax—
Dunkirk, 20 kgs.
Odessa, 4 cks.

Bone Size—
Harlingen, 12 cks.

Bleaching Powder—
Dunkirk, 46 cks.
Rotterdam, 7
Stettin, 328
Venice, 25

Caustic Soda—
Marseilles, 80 drums.
Odessa, 50
Riga, 215
Stettin, 52
St. Petersburg, 214
Venice, 14

Chemicals *(otherwise undescribed)*
Antwerp, 4 cs. 48 pks.
Bombay, 1,337 cks. 100
Bremen, 2 cs. 1 ck.
Copenhagen, 1 4
Constantinople, 56
Christiania, 9 32 3 pks.
Dunkirk, 78
Gothenburg, 9 49 9
Genoa, 65 32
Hamburg, 9 4 3
Harlingen, 113
Konigsberg, 14 117
Marseilles, 20
Naples, 18 60
Odessa, 208
Rouen, 5
Rotterdam, 75
Riga, 5 60
Stockholm, 1 2
Stettin, 4
St. Petersburg, 25 45
Trieste, 2 41
Venice, 22
San Francisco, 37

Dyestuffs *(otherwise undescribed)*
Bombay, 13 cks.
Constantinople, 1 cs.
Hamburg, 5 3 drums
Kurrachee, 40
Mersina, 2
Rotterdam, 9
St. Petersburg, 50 2

Manure—
Antwerp, 10 t.
Copenhagen, 34
Dunkirk, 40
Stettin, 1,526 bgs.

Pitch—
Antwerp, 75 t.

Tar—
Bremen, 100 cks.
Copenhagen, 16
Genoa, 25
Hamburg, 12

PRICES CURRENT.

WEDNESDAY, July 23, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/-	&	12/3
,, Glacial .. .. ,,			64/-
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3¾
Picric .. .. ,,	0	1	1½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2½
Arsenic, white powdered .. .. per ton	13	5	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	10	0
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	15	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/-	&	35/-
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	10	0
,, ,, (grey), Hull .. .. ,,	11	7	6
Aniline Oil (pure) .. .. per lb.	0	0	10½
Aniline Salt ,, ... ,,	0	0	9¼
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/-	to	75/-
Bleaching Powder, 35 % .. .. ,,	5	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	13	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	2	6
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6	to	35/-
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	3	10
,, 50/90 ,, ... ,,	0	2	10
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	8
,, (crude 60°) .. .. per gallon	0	2	2
Creosote (ordinary) .. .. ,,	0	0	3
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	8	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2½
Copper (Chili Bars) .. .. per ton	58	0	0
,, Sulphate .. .. ,,	19	15	0
,, Oxide (copper scales) .. .. ,,	52	10	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	22	0	0

	£	s.	d.
Lime, Acetate (brown) .. .. ,,	7	7	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/-	&	42/6
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	1½
Oils:—			
Cotton-seed .. .. per ton	21	15	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	19	10	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	22	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	21	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	20	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	2
,, Nitrate .. .. ,,	0	2	8
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	2	6
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	5	0
,, ,, (Soda Crystals) .. .. ,,	2	15	0
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	10	17	6
,, ,, (74 % Caustic Soda) ,, ... ,,	10	10	0
,, ,, (70 % Caustic Soda) ,, ... ,,	10	0	0
,, ,, (60 % Caustic Soda, white) .. ,,	9	0	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	8	15	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	3
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	3	17	6
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	10	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8
,, Barium, 95 % .. .. ,,	0	0	5½
,, Potassium .. .. ,,	0	0	8¼
Sulphur (Flowers) .. .. per ton.	8	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	98	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	0	0

THE

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Notices.

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Readers will oblige by making their remittances for subscriptions by Postal or Post Office Order, crossed.

Communications for the Editor, if intended for insertion in the current week's issue, should reach the office not later than **Tuesday Morning.**

Articles, reports, and correspondence on all matters of interest to the Chemical and allied industries, home and foreign, are solicited. Correspondents should condense their matter as much as possible, write on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication. Sketches should be sent on separate sheets.

We cannot undertake to return rejected manuscripts or drawings, unless accompanied by a stamped directed envelope.

Readers are invited to forward items of intelligence, or cuttings from local newspapers, of interest to the trades concerned.

As it is one of the special features of the *Chemical Trade Journal* to give the earliest information respecting new processes, improvements, inventions, etc., bearing upon the Chemical and allied industries, or which may be of interest to our readers, the Editor invites particulars of such—when in working order—from the originators; and if the subject is deemed of sufficient importance, an expert will visit and report upon the same in the columns of the *Journal*. There is no fee required for visits of this kind.

We shall esteem it a favour if any of our readers, in making inquiries of, or opening accounts with advertisers in this paper, will kindly mention the *Chemical Trade Journal* as the source of their information.

Advertisements intended for insertion in the current week's issue, should reach the office by **Wednesday morning** at the latest.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates :—

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Each additional 10 words ..... 0s. 6d. ,,

Advertisements of Situations Wanted are inserted at one-half the above rates when prepaid, viz :—

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Trade Advertisements, Announcements in the Directory Columns, and all Advertisements not prepaid, are charged at the Tariff rates, which will be forwarded on application.

PROFITABLE EXTRAS FOR CHEMISTS.

THE columns of some of our pharmaceutical contemporaries are much agitated of late on the question of "Profitable Extras for Chemists," and the suggestions are many and various. We have nothing to do with the war being waged between the druggist and the competing grocer, but we have a few words to say upon one suggestion for a profitable extra which has been made, and which has a direct influence on the welfare of a Chemist, who has at least as good a claim to a profitable extra as any of his pharmaceutical fellow-men—we refer to the Analyst.

The suggestion has been made, "Take up the practice of analytical chemistry"—as a "profitable extra." We think that the suggestion deserves the attention of our analytical readers, and, in the first place, we must not omit to remind them that the trade of chemist and druggist is protected by law in such a way as to make it difficult for an analyst, even though he be a Fellow of the Institute of Chemistry of Great Britain and Ireland, to engage in the business; while the practice of analytical chemistry can be taken up by anyone. We commend this to the notice of the somnolent Institute mentioned above. Yet behind this ægis of statutory protection, the pharmaceutical fraternity yearn for profitable extras. We confess ourselves at a loss to understand why, for, to take a case, only last week one of our friends requiring a little sulphuric acid went into a pharmaceutical chemist's for a pennyworth of *commercial* oil of vitriol, and received rather less than two ounces by measure of an acid which we, for curiosity's sake, tested and found 148° Twaddell. The price current for such an acid is about 1s. 6d. per cwt. Perhaps the druggist does not class B.O.V. as a "profitable extra." We may, however, class it as "extra profitable." The pharmacist's agitation for "profitable extras" is said to be provoked by other traders picking out those tit-bits from the druggist's business, which enable their retailers to show such a handsome profit from their sale. But the analyst has given them no such provocation. *He* has not even dabbled in patent medicines, although if he desires to do so he has a perfect right to take as his analytical and consulting rooms a set of offices with retail shop accommodation under them and ply the patent medicine, or oil, paint, and horse medicine trade on the same cheap lines as the grocer. Only a few days ago we noticed on the sign of a dispensing chemist the announcement—"Simple analyses done free of charge," which was a revelation to us. In the course of our business, we receive a very considerable number of samples of various kinds for analysis, and we were tempted to make a profitable extra by sending these, or the simple ones to this establishment, and pocketing the receipts, but we were deterred by the consideration that the analysis might be simple to a degree only expressed by potent adjectives, and the results not worth a brass farthing. We fear that an analytical procedure, which consists of licking the cork of a bottle of liquid and saying "Yes, that's quinine," smelling, and "I think that's Epsom Salts," is not entirely free from objection. To paraphrase a sentence we have before us, the *analyst* only feels aggrieved when out-

siders invade his legitimate territory, and when the druggist, the dispenser, the patent medicine vendor, not to mention the *prescribing chemist*, seek to undersell him in that commodity which is universally acknowledged to pertain to his craft.

It behoves analysts to take this matter up and do something as a body, including all denominations, works analysts, public analysts, and analysts in official positions, to secure for the profession that freedom from invasion which, in the most lucrative branch of the druggist's trade, is secured to him by law. We invite the opinion of our analytical readers upon this question.

THE McKINLEY BILL.

WE have procured a copy of the above bill, and make the following extract as being of interest to the chemical trade :—

IN THE HOUSE OF REPRESENTATIVES.

APRIL 16, 1890.

Read twice, committed to the Committee of the Whole House on the state of the Union, and ordered to be printed.

Mr. McKINLEY, from the Committee on Ways and Means, reported the following bill :

A BILL

To reduce the revenue and equalise duties on imports, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That on and after the first day of July, eighteen hundred and ninety, there shall be levied, collected, and paid upon all articles imported from foreign countries, and mentioned in the schedules herein contained, the rates of duty which are, by the schedules and paragraphs, respectively prescribed, namely :

SCHEDULE A.—CHEMICALS, OILS AND PAINTS.

ACIDS.—

1. Acetic or pyroligneous acid, not exceeding the specific gravity of one and forty-seven one-thousandths, one and one-half cents per pound ; exceeding the specific gravity of one and forty-seven one-thousandths, four cents per pound.
2. Boracic acid, five cents per pound.
3. Chromic acid, six cents per pound.
4. Citric acid, ten cents per pound.
5. Muriatic acid, one-fourth of one cent per pound.
6. Sulphuric acid or oil of vitriol, one-fourth of one cent per pound.
7. Tannic acid or tannin, one dollar per pound.
8. Tartaric acid, ten cents per pound.
9. Alcoholic perfumery, including cologne-water and other toilet waters, two dollars per gallon and fifty per centum ad valorem ; alcoholic compounds not specially provided for in this act, two dollars per gallon and twenty-five per centum ad valorem.
10. Alumina, alum, alum cake, patent alum, sulphate of alumina, and aluminous cake, and alum in crystals or ground, six-tenths of one cent per pound.
11. AMMONIA.—Carbonate of, one and three-fourths cents per pound ; muriate of, or sal-ammoniac, three-fourths of one cent per pound ; sulphate of, one-half of one cent per pound.
12. Blacking of all kinds, twenty-five per centum ad valorem.
13. Blue vitriol, or sulphate of copper, two cents per pound.
14. Bone-char, suitable for use in decolorizing sugars, twenty-five per centum ad valorem.
15. Borax, crude, or borate of soda or borate of lime, three cents per pound ; refined borax, five cents per pound.
16. Camphor, refined, four cents per pound.
17. Chalk, prepared, precipitated, French, and red, one cent per pound ; all other chalk preparations not specially provided for in this act, twenty per centum ad valorem.
18. Chloroform, forty cents per pound.
19. Chloride of calcium, one-fourth of one cent per pound.

COAL-TAR PREPARATIONS.—

20. All colours or dyestuffs derived wholly or in part from coal-tar, whether possessing the nature of acids, salts, bases, or chemical compounds, and not otherwise specially provided for in this act, thirty-five per centum ad valorem.
21. All derivatives or preparations wholly or in part of coal-tar, not colours or dyes, and not expressly used as remedies for diseases, not otherwise specially provided for in this act, twenty per centum ad valorem ; pitch of coal-tar, ten per centum ad valorem.
22. Cobalt, oxide of, thirty cents per pound.
23. Collodion and all compounds of pyroxyline, by whatever name known, fifty cents per pound ; rolled or in sheets, but not made up into articles, sixty cents per pound ; if in finished or partly-finished articles, sixty cents per pound and twenty-five per centum ad valorem.
24. Colouring for brandy, wine, beer, or other liquors, fifty per centum ad valorem.
25. Copperas or sulphate of iron, three-tenths of one cent per pound.
26. Drugs, such as barks, beans, berries, balsams, buds, bulbs, and bulbous roots, and excrescences, such as nutgalls, fruits, flowers, dried fibres, grains, gums, and gum resins, herbs, leaves, lichens, mosses, nuts, roots and stems, spices, vegetables, seeds (aromatic, not garden seeds), and seeds of morbid growth, weeds, woods used expressly for dyeing, and dried insects, any of the foregoing which are not edible, but which have been advanced in value or condition by refining or grinding, or by other process of manufacture, and not specially provided for in this act, ten per centum ad valorem.
27. Ethers sulphuric, forty cents per pound ; and spirits of nitrous ether, twenty-five cents per pound ; butyric ether and other fruit ether, oil, or essences, two dollars and fifty cents per pound ; ethers of all kinds not specially provided for in this act, one dollar per pound.
28. Extracts and decoctions of logwood and other dyewoods, extract of sumac, and extracts of hemlock and other barks, such as are commonly used for dyeing or tanning, not specially provided for in this act, one cent per pound.
29. Gelatine, glue, and isinglass or fish-glue, valued at not above seven cents per pound, one and one-half cents per pound ; valued at above seven cents per pound and not above thirty cents per pound, twenty-five per centum ad valorem ; valued at above thirty cents per pound, thirty per centum ad valorem ; printers' rollers, or composition for the manufacture of same, twenty-five per centum ad valorem.
30. Glycerine, crude, not purified, two cents per pound ; refined, four and one-half cents per pound.
31. Indigo, extracts, or pastes of, three-fourths of one cent per pound ; carmined, ten cents per pound.
32. Ink and ink-powders, printers' ink, and all other ink, not specially provided for in this act, thirty per centum ad valorem.
33. Iodine, resublimed, thirty cents per pound.
34. Iodoform, one dollar and fifty cents per pound.
35. Licorice, extracts of, in paste, rolls, or other forms, six cents per pound.
36. Magnesia.—Carbonate of, medicinal, four cents per pound ; calcined, eight cents per pound ; sulphate of, or Epsom salts, three-tenths of one cent per pound.
37. Morphia, or morphine, and all salts thereof, fifty cents per ounce.

OILS.—

38. Alizarine assistant, or soluble oil, or oleate of soda, or Turkey red oil, or by whatever name known, whether made of castor oil or other material, forty cents per gallon.
39. Castor oil, fifty cents per gallon.
40. Cod-liver oil, fifteen cents per gallon.
41. Cotton-seed oil, ten cents per gallon of seven and one-half pounds weight.
42. Croton oil, thirty cents per pound.
43. Flaxseed or linseed and poppy-seed oil, raw, boiled, or oxidized, thirty cents per gallon of seven and one-half pounds weight.
44. Fusel oil, or amylic, butylic, or propylic alcohol, ten per centum ad valorem.
45. Hempseed oil and rapeseed oil, ten cents per gallon.
46. Olive oil, fit for salad purposes, thirty-five cents per gallon.
47. Peppermint oil, one dollar per pound.
48. Seal, herring, whale, and other fish oil not specially provided for in this act, eight cents per gallon.
49. Opium, aqueous extract of, for medicinal uses, and tincture of, as laudanum, and all other liquid preparations of opium, not specially provided for in this act, forty per centum ad valorem.
50. Opium prepared for smoking, ten dollars per pound ; but opium prepared for smoking and other preparations of opium deposited in bonded-warehouse shall not be removed therefrom without payment of duties, and such duties shall not be refunded.

PAINTS, COLOURS, AND VARNISHES.—

51. Baryta, sulphate of, or barytes, including barytes earth, unmanufactured, two dollars per ton ; manufactured, seven dollars per ton.
52. Blues, such as Berlin, Prussian, Chinese, and all others, containing ferrocyanide of iron, dry or ground in water or oil, six cents per pound.
53. Blanc-fixe, or satin white, or artificial sulphate of barytes, three-fourths of one cent. per pound.
54. Black, made from bone, ivory, or vegetable, under whatever

name known, including bone-black and lamp-black, dry or ground in oil or water, twenty-five per centum ad valorem.

55. Chrome yellow, chrome green, and all other chromium colours in which lead and bichromate of potash or soda are component parts, dry, or ground in water or oil, four and one-half cents per pound.
56. Ochre and ochre earths, sienna and sienna earths, umber and umber earths, not specially provided for in this act, dry, one-fourth of one cent per pound; ground in oil, one and one-half cents per pound.
57. Ultramarine blue, four and one-half cents per pound.
58. Varnishes, including so-called gold size or japan, thirty-five per centum ad valorem; and on spirit varnishes for the alcohol contained therein, one dollar and thirty-two cents per gallon additional.
59. Vermilion red, or colours containing quicksilver, dry or ground in oil or water, twelve cents per pound.
60. Wash blue, containing ultramarine, three cents per pound.
61. Whiting and Paris white, dry, one-half of one cent per pound; ground in oil, or putty, one cent per pound.
62. Zinc, oxide of, dry, one and one-fourth cents per pound; ground in oil, one and three-fourth cents per pound.
63. All other paints and colours, whether dry or mixed, or ground with oil, including lakes, crayons, smalts, and frostings, not specially provided for in this act, and artists' colours of all kinds, in tubes, or otherwise, twenty-five per centum ad valorem; all paints and colours, mixed or ground with water or solutions other than oil, and artists' water-colour paints, fifty per centum ad valorem.

LEAD PRODUCTS.—

64. Acetate of lead, white, three cents per pound; brown, two cents per pound.
65. Litharge, three cents per pound.
66. Nitrate of lead, three cents per pound.
67. Orange Mineral, three and one-half cents per pound: *Provided*, That no component of orange mineral shall pay a less duty than twenty-five per centum ad valorem.
68. Red lead, three cents per pound.
69. White lead, dry or in pulp, or ground or mixed with oil, three cents per pound.
70. Phosphorus, ten cents per pound.

POTASH.—

71. Bichromate and chromate of potash, three cents per pound.
72. Caustic or hydrate of, one and one-fourth of one cent per pound.
73. Carbonate of, or fused, twenty per centum ad valorem.
74. Hydriodate, iodide, and iodate of potash, fifty cents per pound.
75. Nitrate of potash or saltpetre, refined, one cent per pound.
76. Prussiate of potash, red, ten cents per pound; yellow, five cents per pound.
77. Sulphate of, refined, two-tenths of one cent per pound.

PREPARATIONS.—

78. All medicinal preparations, including medicinal proprietary preparations, of which alcohol is a component part, not specially provided for in this act, fifty cents per pound.
79. All medicinal preparations, including medicinal proprietary preparations, of which alcohol is not a component part, and not specially provided for in this act, twenty-five per centum ad valorem.
80. Products or preparations known as alkalies, alkaloids, distilled oils, essential oils, expressed oils, rendered oils, and all combinations of the foregoing, and all chemical compounds and salts, not specially provided for in this act, twenty-five per centum ad valorem.
81. Preparations used as applications to the hair, mouth, teeth, or skin, such as cosmetics, dentifrices, pastes, pomades, powders, and tonics, including all known as toilet preparations, not specially provided for in this act, fifty per centum ad valorem.
82. Santonine, and all salts thereof containing eighty per centum, or over, of santonine, two dollars and fifty cents per pound.
83. Soap: Castile-soap, one and one-fourth cents per pound; fancy, perfumed, and all descriptions of toilet-soap, fifteen cents per pound; all other soaps, not specially provided for in this act, twenty per centum ad valorem.

SODA.—

84. Bicarbonate of soda or supercarbonate of soda or salaratus, one cent per pound.
85. Hydrate or caustic soda, one cent per pound.
86. Bichromate and chromate of soda, three cents per pound.
87. Sal-soda, or soda-crystals, and soda-ash, one-fourth of one cent per pound.
88. Silicate of soda, or other alkaline silicate, one-half of one cent per pound.
89. Sulphate of soda, or salt-cake or nitre-cake, one-tenth of one cent per pound.
90. Sponges, twenty per centum ad valorem.
91. Strychnia, or strychnine, and all salts thereof, forty cents per ounce.
92. Sulphur: Refined, in rolls, eight dollars per ton; sublimed, or flowers of, ten dollars per ton; all other forms of brimstone or sulphur, not otherwise provided for, eight dollars per ton.
93. Sumac, ground, one-half of one cent per pound.
94. Tartar, cream of, and patent tartar, six cents per pound.
95. Tartars and lees crystals, partly refined, four cents per pound.
96. Tartrate of soda and potassa, or Rochelle salts, three cents per pound.

SCHEDULE B.—EARTHS, EARTHENWARE, AND GLASSWARE.

BRICK AND TILE.—

97. Fire-brick, not glazed, enamelled, ornamented, or decorated in any manner, one dollar and twenty-five cents, per ton; glazed, enamelled, ornamented, or decorated, forty-five per centum ad valorem.
98. Tiles and brick, other than fire-brick, not glazed, ornamented, painted, enamelled, vitrified, or decorated, twenty-five per centum ad valorem; ornamented, glazed, painted, enamelled, vitrified, or decorated, and all encaustic, forty-five per centum ad valorem.

CEMENT, LIME, AND PLASTER.—

99. Roman, Portland, and other hydraulic cement, in barrels, sacks, or other packages, eight cents per one hundred pounds, including weight of barrel or package; in bulk, seven cents per one hundred pounds; other cement, twenty per centum ad valorem.
100. Lime, six cents per one hundred pounds, including weight of barrel or package.
101. Plaster of Paris, or gypsum, ground, one dollar per ton; calcined, one dollar and seventy-five cents per ton.

CLAYS OR EARTHS.—

102. Clays or earths, unwrought or unmanufactured, not specially provided for in this act, one dollar and fifty cents per ton; wrought or manufactured, not specially provided for in this act, three dollars per ton; china clay, or kaolin, three dollars per ton.

EARTHENWARE AND CHINA.—

103. Common brown earthenware, common stoneware, and crucibles, not ornamented or decorated in any manner, twenty-five per centum ad valorem.

(To be concluded next week.)

AN OPTICAL PYROMETER.

IN the Official Report on War Material in the Paris Exhibition, we find an interesting application of optical polarimetry to the determination of high temperatures. We refer to the Lunette Pyrometrique or Pyrometic Telescope, in which polarisation is applied to the rays of the spectrum. The instrument consists of a small tube of brass having a conical enlargement at one end. The smaller and cylindrical portion is divided into two parts, the first containing an arrangement of lenses, constituting the eye piece, and a Nicol's prism. This is called the analyser, and is fitted to the second tube or part, so as to rotate axially and independently. In the second part is fitted a plane of quartz, cut perpendicular to its optical axis. Behind this is a second Nicol's prism called the polarizer, while in the enlarged end of the instrument is placed the object glass. When an incandescent body is observed through this instrument, the colour visible for a given rotation of the analyser varies according to the temperature, and the passage from one tint to another requires an angle of rotation varying according to the luminous shade observed. A small turn brings the change from green to red, and the angle of rotation indicates the temperature. This test is said to be far more accurate than any judgment based upon observation with the naked eye. Cherry red at about 900°C. requires an angle of 40 degrees on the instrument, white heat at 1,500°C. an angle of 69 degrees to bring about the change of colour. The small illumination produced by temperatures below 900 degrees, renders it difficult to accurately determine them, and an extra large objective is employed. It is stated that this instrument is "largely" used at the St. Jacques Works, and we await further particulars based on actual experience of this interesting application of polarized light.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

JOSEPH AIRD, GREATBRIDGE.—Iron tubes and coils of all kinds.

ASHMORE, BENSON, PEASE AND CO., STOCKTON-ON-TEES.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

BLACKMAN VENTILATING CO., LONDON.—Fans, Air Propellers, Ventilating Machinery.

GEO. G. BLACKWELL, LIVERPOOL.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

BRUNNER, MOND AND CO., NORTHWICH.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

BUCKLEY BRICK AND TILE CO., BUCKLEY.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

CHADDERTON IRON WORKS CO., CHADDERTON.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. CLAY, EDINBURGH.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

CLAYTON ANILINE CO., CLAYTON.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. CORTIN, NEWCASTLE-ON-TYNE.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. DAGLISH AND CO., ST. HELENS.—Photographs of Chemical Plant —Blowing Engines, Filter Presses, Sludge Pumps, &c.

DAVIS BROS., MANCHESTER.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. DEMPSTER, MANCHESTER.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

DOULTON AND CO., LAMBETH.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. FAHRIG, PLAISTOW, ESSEX.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

GALLOWAYS, LIMITED, MANCHESTER.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

JOHN A. GILBERT AND CO. LTD., LONDON.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

GRIMSHAW BROS., LIMITED, CLAYTON.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

JEWSBURY AND BROWN, MANCHESTER.—Samples of Aerated Waters

JOSEPH KERSHAW AND CO., HOLLINWOOD.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. LINDSEY AND CO., CLAYTON.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

CHAS. LOWE AND CO., REDDISH.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

MANCHESTER ANILINE CO., MANCHESTER.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

MELDRUM BROS., MANCHESTER.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. MILNES AND BROTHER, BURY.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

MUSGRAVE AND CO., BELFAST.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

NEWCASTLE CHEMICAL WORKS COMPANY, LIMITED, NEWCASTLE-ON-TYNE.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

ROBINSON, COOKS, AND COMPANY, ST. HELENS.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. ROYLE, MANCHESTER.—Steam Reducing Valves.

A. SMITH, CLAYTON.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

WORTHINGTON PUMPING ENGINE COMPANY, LONDON.—Pumping Machinery. Speciality, their "Duplex" Pump.

JOSEPH WRIGHT AND COMPANY, TIPTON.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

ON SOME DIFFERENT KINDS OF GAS FURNACES.

By Mr. BERNARD DAWSON, of Malvern.

(A paper set down for reading before the Institution of Mechanical Engineers at Sheffield.)

SINCE the two papers read by the late Sir William Siemens before this Institution on Regenerative Furnaces (Proceedings 1857, page 103, and 1862 page 21), several papers upon gas producers and various forms of regenerative gas furnaces have been read and discussed during the last few years at the meetings of other kindred institutions in this country; but as far as the author is aware, they have either been devoted chiefly to the description of particular forms of reversing regenerative furnaces, or else have been reviews of the progress made in the construction of gas producers in various countries. Omitting now any reference to the rival generators or producers in which the heating gas must first be made, the present paper will describe a few typical or representative varieties of Gas Furnaces.

The greater number of gas furnaces, in which crude heating gas has been successfully applied, have been of the kind now universally known as Reversing Regenerative Furnaces. There are many processes, however—requiring various degrees of temperature below that which can be maintained with any regularity by the use of regenerators only (of the kind associated with the name of Sir William Siemens)—in which gas furnaces have been used with some degree of success, both as regards economy in quantity and quality of fuel consumed to do a given quantity of work, and also as regards increased speed of work, saving in wear or destruction of the furnaces themselves, saving in labour, abolition of smoke, and the certainty of being able to maintain an atmosphere or flame, either of a reducing or of an oxidising nature: the two latter being essential conditions in many manufacturing processes. In large works it is often a further great advantage to be able to concentrate in one place the manipulation of all the fuel required in the various furnaces scattered throughout the different departments or shops, as also to avoid the nuisance arising from having to clean the fires and to remove the ashes. It is, therefore, at times a distinct advantage to employ gas for heating furnaces in which the saving in cost of fuel is itself a secondary or comparatively unimportant matter.

The exact point at which it is advantageous to dispense with the somewhat costly system of reversing regenerative chambers is one on which there is some diversity of opinion. There are, of course, many furnaces, which can be and are being heated by gas, in which the temperature required is not high enough to render reversing regeneration either economical or even advisable; and the present paper is intended to illustrate a few such cases. It is probable, however, that the many comparatively low-temperature gas furnaces, to which such regeneration has been successfully applied at the new locomotive works of the Lancashire and Yorkshire Railway at Horwich, may lead to this form of furnace being more generally adopted in future for such work as annealing steel castings, heating plates and angle bars for locomotive and marine boiler work and for ship yards, where a uniform temperature all over a large plate is required for flanging or bending. On the other hand there are many furnaces in which the higher temperature required is such as cannot be attained by the combustion of producer gas with cold air, but in which, with air heated in flues by radiation or conduction from the bed of the furnace and from the flues leading from the furnace to the chimney, a satisfactory result is attained, with some saving in first cost in building the furnace, and without the necessity for much excavation below the bed or hearth of the furnace. The use of gas with cold air is necessarily wasteful, owing to the inability to recover the waste heat from the flame or products of combustion before they pass away to the chimney; and this waste may be prevented by the employment of what may be termed continuous, as opposed to reversing regeneration.

In furnaces of this kind, as also in those with reversing regeneration, care must be taken to ensure that the escaping gases or waste heat shall pass into the chimney flues at a sufficiently high temperature to secure the amount of draught requisite for working the furnace advantageously. The author has seen many reversing gas furnaces, in which, in the anxiety to provide area enough in the regenerators to recover the waste heat instead of letting it pass to the chimney unused, the temperature of the escaping gases at entrance to the chimney has been so low as to make the furnace a failure, either entirely or comparatively. Inattention to the real principles of gas furnaces has done much to bring into disrepute the Siemens regenerative furnace for reheating piles and ingots and for other similar processes; and the author thinks that the recent remarks of Mr. John Head in the discussion upon Sir Lowthian Bell's paper on gaseous fuel at the Paris meeting of the Iron and Steel Institute (Journal 1889, II, page 154) are well worth the attention of those who complain of the inefficiency of many reversing furnaces in this country. Not long ago there was an instance of a re-heating furnace which was working very badly, and using considerably more fuel per ton of ingots heated than the coal-fired furnace which it had replaced. It certainly appeared to possess every fault which such a

furnace could have; and on enquiry it was found that it had been built from the drawings of an open-hearth steel-melting furnace, with no alteration except the provision of a flat hearth, and the substitution of a cinder or slag spout in place of the casting spout of the steel furnace. This is believed by the author to be by no means an isolated instance of the way in which home-made or rather home designed gas furnaces are sometimes erected. Unfortunately, designs for gas furnaces of different kinds, both regenerative and non-regenerative, and with various forms of continuous regeneration, have been proposed to manufacturers and carried out by them in ignorance of the true principles of combustion of gaseous fuel; and the author has known some egregious and costly failures with experimental and untried furnaces for various special processes during the last ten or eleven years that he has been engaged in this class of work. Some of these furnaces, by attention to the bad results attained and study of the causes, have ultimately been made to succeed. Others, either from inability to rectify them or from disinclination of their users to spend money upon further trials, have been abandoned. An instance of the failure of a reversing regenerative furnace to give any satisfactory result occurred in South Wales some years ago, in a long furnace intended for the close-annealing of tin plates; in that case, owing to the length and shape and temperature of the furnace, there was practically no heat left to regenerate when the waste gases quitted the furnace. This same furnace is now working satisfactorily with some slight continuous regeneration or heating of the air used for combustion of the gas. In many cases where the low level of the land on which the furnaces are built, the presence of water below the ground line, and other local circumstances, preclude the use of underground reversing regenerators, continuous regeneration has been successfully adopted.

Gas furnaces may therefore properly be divided into four classes, namely:—(*a*) with reversing regeneration; (*b*) with continuous regeneration; (*c*) non-regenerative; and (*d*) with blow-pipe or forced blast.

(*a*) *Furnaces with Reversing Regeneration* are of several different kinds.

1. The ordinary Siemens furnace, in which both gas and air are heated before admission to the interior of the furnace, by being passed through the well-known arrangement of brick chambers filled with chequer work or loosely piled bricks.

2. The Batho or Hilton furnace, in which the regenerative chambers, instead of being partly or entirely underground, are encased in cylindrical wrought-iron vessels erected upon the ground level.

3. Furnaces in which the air only is regenerated by being passed through chambers, the gas being admitted direct from the flues by which it arrives from the producers. In these furnaces the whole of the escaping gases or waste heat has to pass through one of the two air-chambers on its way to the chimney.

4. The furnace recently described by Mr. Head (Iron and Steel Institute Journal, 1889, II, page 256), in which a portion of the waste heat is taken back to the gas producer.

5. The various regenerative blast-furnace stoves of the Cowper, Whitwell, and other kinds. For the purposes of the present paper, however, these are not considered as gas furnaces, and will therefore not be further referred to.

(*b*) In *Furnaces with Continuous Regeneration* the air, before admission to the interior of the furnace, is heated in flues or pipes, by radiation or conduction from the bottom of the furnace, and through thin walls which separate the air-flues from the flues that carry the spent gases or waste heat to the chimney.

(*c*) In *Non-Regenerative Furnaces* the air is admitted to the interior of the furnace at its natural or atmospheric temperature.

(*d*) *Blow-Pipe or Forced-Blast Furnaces* are of two kinds:—firstly, those in which the air is supplied at its natural or atmospheric temperature by a fan or blower; secondly, those in which the air so supplied is heated by the spent gases or waste heat from the furnace, by being passed either through coils or stacks of pipes or else through brick tubes or flues, as in the case of the Radcliffe furnace and others.

Furnaces with Reversing Regenerators for both air and gas have of course been built, principally for such high temperatures as are required for melting steel, copper, nickel, zinc, and glass; for heating iron piles and steel ingots; for forging furnaces, and heating furnaces in connection with stamping and flanging presses; for tire furnaces, tube welding, heating gas-works retorts, burning pottery and bricks, and so forth. Reversing furnaces in which the air only is regenerated are used for annealing steel castings and wire, for burning pottery, for melting brass and phosphor bronze, for annealing nails, and for other such purposes not requiring intense or welding heats. This class is illustrated by

(*a*) A longitudinal section of a 24 pot or crucible steel furnace.

(*b*) A 12-ton basic steel furnace of the kind introduced by the late Mr. Batho, in order to obviate the necessity of having the furnace regenerators below the ground line. Many of the earliest furnaces erected of the ordinary Siemens type had the entire weight of the furnace and its charge resting on the arches of the regenerators. This is now never done; and in addition to this drawback to the early Siemens furnaces, Mr. Batho called attention to the difficulties connected with underground regenerators, in regard to water and to the time occupied in changing the soap bricks or chequer work; and in these and other respects he claimed important advantages for his plan of encasing the regenerators in wrought-iron vessels above ground.

(*c*) An ordinary Siemens furnace with the regenerators above ground. This was built in America. The difficulty is not so much that of minimising loss of heat by radiation as of keeping the brick-work gas and air-tight. It is illustrated as an interesting attempt to solve the difficulty, necessarily arising upon some sites, of providing regenerators above ground.

(*d*) What is probably the smallest regenerative heating furnace used. Its hearth contains only 12 square feet of area.

(*e*) A bar-heating furnace for shipyard and boiler-shop work. The flues beneath it form its reversing regenerators.

(*f*) A reheating furnace for ingots or piles, etc., in connection with a plate mill.

(*g*) A 10-ton basic open-hearth furnace.

(*h*) A furnace for heating tires with air regeneration only.

(*i*) An intermittent glass tank-furnace erected for a small glass works in South America, and is shown as being probably the smallest glass tank-furnace ever built.

Continuous Regeneration Furnaces are used for muffles, low-temperature annealers, furnaces for close and open annealing of sheet iron and tin plates, of brass and copper tubes, cartridge cases, and wire. In this class illustrations are given of

(*a*) A furnace for close-annealing sheets or tin plates, with continuous regeneration. In one portion of it the top of the truck or bogie carrying the pots or boxes of plates forms itself the bottom of the furnace; in the other portion the boxes are run in and out on spherical cast-iron balls.

(*b and c*) Annealing ovens for cartridge cases, thin metal, brass and copper wire, brass shells, &c. Both having a certain degree of continuous regeneration.

Non-Regenerative Furnaces are used for such low temperatures as are employed for evaporating brine, for boiling and distilling oil and tar, brewing pale ale, drying slurry in cement works, drying foundry cores and moulds, revivifying charcoal in sugar works, and burning carbon for electric-light purposes. Also for firing steam boilers of all kinds; for heating revolving and other furnaces at chemical works, black-ash and sulphate of soda furnaces; for evaporating waste leys and black liquor in paper mills; for roasting and calcining ores; and for many other industrial purposes too numerous to recapitulate. This class is illustrated by

(*a*) A plate-heating furnace in use in locomotive and other boiler shops.

(*b*) A sand-drying or calcining furnace for an open-hearth steel plant.

(*c*) Gas applied to foundry core and mould stoves.

(*d*) A gas-fired oil boiler or still.

(*e*) A gas-fired brewer's copper.

(*f*) A gas-fired slurry floor in a cement works.

(*g*) Babcock and Wilcox and Lancashire boilers fired by gas.

Blow-Pipe Furnaces, into which heated air required for combustion is delivered under pressure, have been used for puddling iron, melting brass in pots, heating plates for stamping into railway sleepers, melting zinc ores, welding tubes, etc. But with the exception of some few puddling furnaces on the Continent, the author believes that this application of producer gas has not yet been carried to a success; the difficulty in working any such furnaces as he has had an opportunity of seeing has consisted in maintaining a regular flame or heat, because the slightest variation in the volume, pressure, or quality of the gas produces immediately a marked effect in the furnace. It is also essential that the annular orifice through which the air is forced in, all round the gas inlet, should be of perfect workmanship and smooth surface, and of correct shape and proportion; this condition, with fire-clay or fire-brick nozzles exposed to the fierce heat of the gas blow-pipe, is very difficult to preserve; while the attempt to provide for the continual variation in the gas, by using a sliding or adjustable cap or nozzle to the blast pipe, has proved impracticable. Some of these furnaces have worked admirably in an intermittent way; and the conclusion apparently arrived at has been that they are too delicate and complicated to be handled by ordinary furnace-men.

Illustrations given of

(*a*) A revolving furnace worked with gas and heated air and a blow-pipe nozzle.

(*b*) A furnace worked successfully for heating thin plates for stamping into railway sleepers, etc.

(*c*) A crucible silver-melting furnace with blow-pipe.

(*d*) A Radcliffe steel-melting furnace.

The failure of some *non-regenerative* furnaces may be attributed to losing sight of the different specific gravities of hot producer-gas and cold air; and also to neglecting to impart to the air, before it meets and mixes with the gas, some impetus or motion in the same direction in which the gas is travelling on its entrance into the furnace. For instance, where cold air is admitted in a horizontal stream over the gas which is rising vertically or obliquely from the gas valve, intimate mixture and perfect combustion are rarely attained; in addition to which, small explosions and other troubles are frequently experienced. In other cases the introduction of the gas and cold air into the furnace in parallel streams, or in any large volumes, either side by side or over one another, has led to failure. In furnaces to be heated by gas and cold air, either the volume of each should be split up into a number of small streams by perforations in the walls forming the inlet to the furnace; or else some form of combustion chamber should be provided, in which the gas and air can be mixed and partially ignited before admission into the actual furnace itself.

(To be continued.)

[We are indebted to Mr. Dawson for an advance copy of this paper, which was crowded out at the Sheffield meeting. The illustrations referred to in the text were diagrams prepared for exhibition to the meeting.—Ed. *C.T.J.*]

Legal.

HIGH COURT OF JUSTICE—QUEEN'S BENCH DIVISION.

(Before Mr. Justice Day, *without a Jury.)*

MASON AND BARRY (LIMITED) V. COMPTOIR D'ESCOMPTE DE PARIS.

This was one of the cases arising out of the transactions in copper, and involving immense amounts, which have been, in various interlocutory applications, so often before the Courts, and have on such applications been repeatedly reported. They now came before the Court for the purpose of trial, and they were the first that came on to be tried, and it will be observed that (by the consent of the parties) it was tried before the Judge without a jury. The basis of all the transactions and the source and origin of all these actions was an attempt by the Société des Métaux, a firm in Paris, to get a monopoly of the supply of copper by buying up all the copper they could obtain by contracts with the producers of copper, and among others the now plaintiffs, large mine owners in Portugal, and having offices in London. These contracts were of such magnitude that the purchasers required security, which was given, as they conceived, by the Comptoir d'Escompte in Paris, a kind of financing association, the business of which *inter alia* was to be "in undertaking all payments in Paris," &c. In the result the burden these immense transactions was too heavy for the Société des Métaux, which therefore went into liquidation, and then the houses with which they had contracted, and among others the present plaintiffs, came upon the Comptoir d'Escompte upon their guarantee for payment, and that company set up a defence on several grounds, chiefly that the supposed guarantee was not within the scope of its constitution and powers, and was in legal phrase *ultra vires*, and, further, that the transactions which were the object of the supposed contracts and guarantee were contrary to public policy as tending to a monopoly, and so illegal and invalid, both according to the law of England and the law of France, as to which last some of the most eminent French lawyers, including the *Batonnier* of the French Bar, were in Court to give evidence on either side. The present action was on the guarantee of a contract by the plaintiffs to sell to the Société Industrielle et Commerciale des Métaux copper in value to the amount of £99,000. That contract was dated March 25th, 1888, the material parts of which were as follows:—The Société des Métaux was to buy of the plaintiffs the whole of their shipments of copper precipitate to arrive from Portugal during the years 1888, 1889, 1890, with the exception of quantities already sold to and contracted for by other parties,. The copper was to be shipped to the Mersey or Swansea and payments to be made in London. The price of the copper was to be £65 per ton. The guarantee given by the Comptoir d'Escompte was as follows:—

"Messrs. Mason and Barry (Limited), 87, Cannon-street, London.—Gentlemen,—In consideration of your entering into a contract with the Société Industrielle et Commerciale des Métaux for the sale to them of certain precipitate, we guarantee the due payment in sterling to you in London of all sums of money which the Société shall become liable to pay in respect of all precipitate which must be delivered pursuant to such contract during the years 1888-89 and 1890, such guaranteed payments to be made upon presentation at No. 52, Threadneedle-street, in the City of London, of each invoice of such precipitate. And we agree that this guarantee shall not be affected by your giving time to the Société for payment, accepting or renewing any bill of exchange, or parting with or exchanging any security, or forbearing to sue them in respect of any claim arising out of such contract, nor by your doing or omitting to do or suffering or permitting any act to be done which would, apart from this stipulation, discharge us or otherwise affect our position as sureties, but we are not liable for any payment which by reason of your having given time without our approval shall become payable after the 31st day of November, 1890.

"And for the purposes of this guarantee, and of any legal proceedings arising thereout, we hereby elect domicile at our said office, No. 52, Threadneedle-street, in the city of London, and agree that the law of England shall be applicable to and shall govern this guarantee, and that her Britannic Majesty's High Court of Justice shall have jurisdiction over any dispute that may arise upon or in respect thereof.—Yours faithfully, Comptoir d'Escompte de Paris (le Directeur, pp. le Sous-Directeur, A. Renaud)."

Sir Charles Russell opened the case for the plaintiffs, and stated that the only real point in the defence was that the guarantee sued upon was *ultra vires*—that is, beyond the scope of the proper business of the Comptoir d'Escompte. As to the defence on the ground of public policy, he observed, sarcastically, that it had only occurred to the mind of the company when called upon for payment.

Mr. Finlay proposed to read a translation of a copy of the minutes of meetings of the Comptoir d'Escompte held between March 13th, 1888, and June 12th, 1888, the minutes themselves having been impounded in the French Courts.

The Attorney-General objected on the ground that such a copy was inadmissible; but upon it being proved that the copy was furnished by the defendants' solicitors,

The learned Judge held that the copy was admissible in evidence.

The minutes were then read, and showed an entry, "The manager lays on the table the day-book of operations with the Société des Métaux." The day-book contained the following entry:—"April 10—Guarantee given to Mason and Barry. Duration, 1888 to 1890. Amount, 6,550 tons per annum. 19,650 tons equals £1,147,205. Commission, 18,100 francs."

Mr. C. H. Barry was then called, and said he was the secretary of the plaintiff company. The plaintiffs delivered nine shipments of copper. Invoices were left at the defendants' offices in London. The plaintiffs had not been paid.

Cross-examined.—He knew nothing about the copper ring. In 1887 and 1888 copper was rising very rapidly. He did not know how it was brought about. From June to October, 1887, it was under £40. On January 1, 1888, it was £85. He made no inquiry as to the cause of the rise. Messrs. Morrison and Kekewich are metal brokers. They were paid commission for transacting the business with the Société des Métaux. At the time of the contract, on March 28, they had no knowledge that three other companies had joined the ring. The Rio Tinto, Tharsis, and Cape Copper Companies were the three that joined the ring. Mason and Barry and those three produced 50,000 tons per annum, about one-fourth of the total production of the world. He knew the Société des Métaux caused the great rise. In September, 1888, copper was at £100. a ton. In April, 1889, it had fallen to £39.

Mr. James Mason, examined, said he was one of the directors of the plaintiff company. M. Secrétan proposed to buy one-third of plaintiffs' copper for his own use, and guarantee them a fixed price for the rest. He said the plaintiffs could not enter into such an arrangement. M. Secrétan asked whether plaintiffs would sell their copper over three years. He said he saw no objection to that. The object of the Société des Métaux in purchasing from the different companies was to maintain the price of copper. That was the object of M. Secrétan in negotiating with plaintiffs. The negotiations were concluded with Messrs. Pitcairn and Campbell, Morrison and Kekewich, and Coulon and Berthoud and Co.

The statutes of the Comptoir d'Escompte de Paris having been put in evidence, that was the close of the plaintiffs' case.

The Attorney-General, in opening the defence, said the case was of extreme importance, as it involved the question of £5,000,000, for which the shareholders of the defendant Société were liable. The Comptoir d'Escompte was an old corporation governed by statutes. His main argument would be that there was not one word in the statutes which justified the giving of the guarantee. The guarantee was inconsistent with the powers conferred upon the directors. The company was one of the great banking and discount companies of France, and had existed since 1842. The action was upon a contract of guarantee given by the defendants upon goods supplied to the Société des Métaux. At the end of the year 1887, for the purpose of raising the price, the Société des Métaux had been purchasing enormous quantities of copper. It was essential, in order to maintain the price, that some person should be able to control the supply of the market. It was clear to Messrs. Mason and Barry that their produce was going to be bought by persons who were about to create a fictitious price. That was done by the operation of M. Secrétan.

By the law of France any such arrangement was illegal. M. Secrétan had been convicted of an offence against the French law in respect of these transactions. By article 419 of the Penal Code and by other articles of the Code no guarantee was good which was given in respect of an illegal transaction. M. Renaud had no power to sign the guarantee on behalf of the Comptoir d' Escompte. He should be able to prove that the contract of Messrs. Mason and Barry had not been laid before the directors of the Comptoir d'Escompte. By the contract of March 28 the Société des Métaux got the copper and had to pay in cash within two months, and it was contended that a bank could guarantee the payment, whatever was the price or value of the article. Sir C. Russell asked the Court to liken the case to a bank's endorsing bills upon getting warrants handed over to them. How could that be, when the Comptoir d'Escompte got no security? Turning to the statutes of the Comptoir d'Escompte, Article 8 was as follows :—

"The operations of the Comptoir consist—(1) in discounting commercial paper payable in Paris, in the provinces, and abroad, engagements subscribed to the order of the guarantee, *sous-comptoirs* created around it, bills to its order, accompanied by receipts for goods deposited in public warehouses approved by the State in the form of warrants, or in any other forms which may be authorised by the laws or regulations, and in general all sorts of engagements to order, and at fixed maturity, resulting from commercial or industrial transactions; (4) in making advances upon French Rentes, shares or bonds of industrial or credit enterprises formed into French joint-stock companies *(société anonymes)* upon securities issued by the State, the departments, towns, and communes, and all other public administrations, the shares and bonds of French railway companies having a *minimum* interest guaranteed by the State, but only to the extent of four-fifths of the current value of these Rentes or shares, and upon condition that they shall only be made for 90 days at most; in undertaking all payments and recoveries in Paris, in the provinces, and abroad, in granting and accepting all orders, cheques, drafts, and bills of exchange, for which cover has been previously given either in cash, or by means of transfer of bills of lading or transfer by way of pledge (dont la couverture aurait été préalablement fait, soit en espèces, soit au moyen de transferts de connaissements ou du transport à titre de nantissement) . . . . or in securities approved by the board of directors (soit en valeurs agréées par le conseil d'administration)."

The Attorney-General, continuing his address, said,—The guarantee was not within the powers conferred by the above article. There was no cover of any sort or kind, nor securities approved by the board of directors. The Société des Métaux might sell the copper and the money might have gone, then the guarantee would give the plaintiffs power to come down on the Comptoir d'Escompte. If the case stood upon the contract of Mason and Barry and the guarantee alone, then there would be an end of the case. But that was not all. The Société des Métaux had undertaken to purchase 600,000 tons of copper out of the whole 674,000 tons of copper produced during three years, and the defendants had guaranteed the payment of almost the whole that the Société bought. There was another minor point. The guarantee was signed by Renaud. He had power by virtue of a power of attorney, which did not authorize him to sign a guarantee. The guarantee was invalid according to French law, and he would contend that it could not be enforced in England.

Mr. BIGHAM asked that a note should be taken of the amount of the purchases of the Société des Mètaux, and the names of the vendors.

Mr. FINLAY submitted that they were not evidence, and objected to their being put in.

The learned JUDGE held that they were admissible.

Mr. BIGHAM then proposed to give evidence of the extent of the guarantees given by the Comptoir.

Mr. FINLAY objected.

The learned JUDGE said it was not necessary for him to decide now whether they were admissible. If they were referred to in the Court of Appeal, and that Court held they were evidence, then in such case they could be read in that Court without the case being sent back to him, on the ground of refusal of evidence.

M. F. M. Feuillet was called, and, in answer to the ATTORNEY-GENERAL, said he was an ex-minister of justice and a practising advocate. He had perused the statutes of the Comptoir d'Escompte. According to French law, a *société anonyme* could not act outside its statutes. The Comptoir had been in existence since 1848. The statutes had been modified from time to time by Acts of State. (The last statutes of the Comptoir d'Escompte were handed to witness.) He had seen the guarantee given by M. Renaud, sous-directeur of the Comptoir. He had also seen the contract of Mason and Barry. According to French law, the giving of the guarantee was not within the powers of the Comptoir d'Escompte. Article 19 of the Penal Code forbids the making of arrangements to raise the price of goods. There is an article of the French Code which deals with guarantees. That article provided that guarantees could only exist on a legal obligation. He heard that the Société had entered into contracts with most of the copper mines of the world. The mines had undertaken to limit their productions. The Société agreed to take the produce at a fixed price, and the Comptoir had guaranteed them. The Comptoir could not enter into a guarantee outside Article 8. Question.—Putting aside the statutes, if the guarantee had been given by a private individual, would it have been binding? Answer.—No; because the obligation upon which the guarantee was given was illegal. The matter had come before the Tribunal of Commerce of the Seine in the "Tammarack" case. That case was under appeal. The decision was that the engagement of the Comptoir was contrary to its statutes. An action for damages was brought against the Comptoir upon a guarantee given to the Tammarack Mining Company by a director of the Comptoir. Criminal proceedings had been taken against M. Secrétan, M. Hentsch, and M. Laveissière. MM. Secrétan and Laveissière were convicted of conspiracy; M. Secrétan and M. Hentsch for the distribution of fictitious dividends. By the terms of the guarantee, the Comptoir, having elected domicile in England, could not extend its powers.

Cross-examined.—All the decisions he referred to were under appeal. The judgments of the Tribunal of Commerce were just as weighty as any other Court. He had read Article 8. He said that an engagement to pay for goods delivered was not within it, because it was not an operation of discount. A contract of guarantee, such as the one in this action, was not among the things enumerated in the article. The Comptoir was not bound when the directors acted outside its statutes.

M. Groz, examined, said he was a doctor of laws and advocate of the Court of Appeal. He had heard the evidence of M. Feuillet, and agreed with it.

At this stage of the case the Court adjourned till Monday.

Sir Charles Russell, Q.C., Mr. Finlay, Q.C., and Mr. Hollams were counsel for the plaintiffs; the Attorney-General, Q.C., Mr. Bigham, Q.C., and Mr. H. Tindal-Atkinson for the defendants.

COLORIMETRIC METHOD FOR TANNIN.

DISSOLVE 0·04 grm. potassium ferricyanide in 500 c.c. water, and add to it 1·5 c.c. (about 22 drops) *Liquor Ferri Chloride.* Call this *iron mixture.*

Dissolve 0·04 grm. pure tannin (gallotannic acid), which has been dried at 212° Fahr., in 500 c.c. of water. Call this *tannin solution.*

Exhaust 0·8 grm. oak bark with boiling water, and make it up to 500 c.c. with cold water.

Place six 2oz. clear glass tumblers (or beaker glasses) on a white surface, and in one of them, *with a dropping pipette* (about four inches long and a ¼in. wide) *about half filled,* put five drops of the infusion of bark, and in the others *with the same pipette* (after rinsing), put 4, 5, 6, 7, and 8 drops of the tannin solution. (The drops of the infusion and of the tannin solution must be uniform. The use of the same pipette about half filled ensures that.)

Now add to each, 5 c.c. of the "iron mixture," and in about one minute add to each tumbler about 20 c.c. of water, and *within three minutes* observe the shades of colour. The number of drops of "tannin solution" used in the tumbler that corresponds in shade of colour to the tumbler containing the infusion of bark indicates the percentage of tannin in the bark, *i.e.*, if it is the one in which seven drops were placed, the tannin strength of the bark is seven per cent.

It is best to observe the shades of colour horizontally rather than vertically, and to hold up the infusion tumbler, with the one which most nearly corresponds, opposite to a white wall, with one's back to the light. The same process is applicable for any substance containing less than 10 per cent. of tannin.

The results are necessarily in terms for commercial gallotannic acid, and not in those of pure tannin, or of the particular tannin in the material assayed.

For substances containing between about 10 and 20 per cent., it is best to dilute the infusion with an equal quantity of water, and proceed as above, using *five drops* of the *dilute infusion*, and to obtain the answer, double the result. Thus if the *diluted* infusion of tea required eight drops tannin solution to correspond, call the percentage sixteen.

For substances containing less than 1 or 1½ per cent., exhaust 8 grm. instead of 0·8 grm., and take *one-tenth* of the result for the answer. For substances containing more than 20 per cent., as galls, sumach, catechu, etc., dilute the infusion to two, three, or more times its bulk with water, and calculate as above (as with tea), or, otherwise, use 1, 2, 3, or 4 drops of the undiluted infusion in the first glass, and make the calculation thus :—As the number of drops of infusion used is to the number of drops of "tannin solution" (to correspond) so is 5 to the answer—thus: suppose two drops infusion were used and the corresponding tumbler contained 15 drops tannin solution—2 : 15 :: 5 —37·5 per cent.

The object in diluting the infusions is because the infusion glass may

be of too deep a blue shade. It is better that it should just produce a light blue. The tumblers must be perfectly clear and clean. The "iron mixture," "tannin solution," and infusion must be freshly prepared and not exposed to the rays of the sun. The water used must be free from iron and tannin.—*Textile Mercury.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

G. H. & Co., Ltd.—Thanks, but the matter is scarcely suitable for our columns.
Alpha.—Try sulphuric acid, 168° Twad.
Experimenter.—(a.) A ten per cent. solution of alum. (b.) It is used to remove the sulphur impurity. There is a good market for it.
Brick Kilns.—Write to the Local Government Board, Whitehall.
Wire Rope.—The patent is not valid.
A Subscriber.—No Wonder, if you accept the "Science" (?) of the daily press.
No Name.—You do well to adopt the *nom de plume*, as you omitted to send your card.
T. H. C. (Honolulu).—To an English correspondent we should have recommended a reference to the numerous free libraries, but we are sending you a specification per post. Thanks for your good wishes.
Charles King.—Surely there are libraries in Berlin where you can see the indices.

Letters from "Llewellyn J.," "Iroquois," "Antichlor," were written on both sides of the paper.

*** *We do not hold ourselves responsible for the opinions expressed by our correspondents.*

THE MIDLAND RAILWAY WORKS AT DERBY.

To the Editor of the Chemical Trade Journal.

Sir,—I am glad to learn that the Midland Railway Company do not fail to analyse so important an article as brass locomotive tubes, and also that they make their own axle-grease. During a cursory inspection of a works, it is not always easy to obtain accurate information, and inquiries are occasionally misunderstood, and the replies are accordingly misleading. I am much obliged to Mr. Archbutt for his correction.—I am, etc., The Writer of the Article.

Completion of the Sewage Purification Works at Pendlebury.—Pendlebury is one of the many places which have been contributing to the pollution of the river Irwell. Compared with some of the other sources of the evil, this part of the district of the Swinton and Pendlebury Local Board may be said to be but a small offender, as the population does not much exceed 5,000, but, as is frequently the case with small places, the sewage is of a particularly foul nature, and contains a relatively large quantity of manufacturers' refuse. Some time ago, the Local Board decided to take measures to abate the nuisance caused by the sewage of this part of the district, and purification works were commenced at the Slack Brook from the designs of Mr. Mountain, late surveyor to the Swinton and Pendlebury Local Board. The system of purification adopted is that of the International Water and Sewage Purification Company, Limited, which has also been adopted by many other towns in the neighbourhood of Manchester and near London. It is well to note, however, that the Pendlebury works are the first in Lancashire where the process is in regular operation, although large experimental works have been set up at Weaste for trial by the Salford Corporation, and are now acting with complete success. The works under notice consist of four tanks, into which the sewage flows for precipitation after the addition of the proper quantity of the precipitant "Ferozone" by means of an automatic mixer, the patented invention of Mr. Charles H. Beloe, of Liverpool and Westminster, the consulting engineer to the company. These tanks have been constructed of capacity sufficient to cope with the sewage of a very largely increased population. From the tanks the water is drawn off to filters having an aggregate area of 144 square yards, which contain a layer of "Polarite," the material upon which the company depends for the removal of the matters in solution which have not been attacked by the precipitant. From the filters the effluent flows bright and clear, and analysis shows it to be in a state of purity which exceeds that of many wells from which water for domestic purposes is drawn. By an ingenious arrangement of the filters they are made self-cleansing, and thus the labour of removing the top stratum for washing is avoided. Further, it is not necessary to disturb the body of the filtering material, as the polarite does not need renewal. The other part of the district—Swinton—has been provided with a sewage farm of 32 acres in area, but some time ago an injunction was threatened against the Local Board with reference to the pollution of the stream, and in consequence Mr. M'Callum has there constructed works of a similar nature and for the same process, but much larger, the filters in this case having an area of 350 square yards. These will be completed in a few weeks.

OUR PRIZE COMPETITION.

We have now carefully gone over the papers sent in for competition upon the terms offered in the early issues of this year, and have placed the competitors in the following order:—

Subject II.

1. Henry N. Warren,
   18, Albion Street,
   Everton, Liverpool.
2. W. T. Storne,
   Laboratory, Somerset House,
   London, W.C.
3. J. H. Dagger,
   Laboratory of the Cowles Syndicate Co.,
   Milton,
   nr. Stoke-on-Trent.
4. Henry Bailey,
   1, Sea View Terrace,
   Camborne, Cornwall.
5. H. W. Dains,
   15, Spring Street,
   Baker Street, London, W.
6. J. M. No address given.
7. P. Whelan,
   Star Chemical Works,
   Wandsworth Bridge Rd.,
   Fulham, London, S.W.

We have therefore forwarded cheque, value five pounds, to Mr. H. N. Warren, and another of one pound to Mr. W. T. Storne; Messrs. Dagger, Bailey, Dains, and Whelan being placed upon our free list for twelve months, in accordance with the terms of our announcement.

Subject I.

We regret to say that none of the competitors in Subject I. have sent papers sufficiently novel or valuable to justify any award. They are merely descriptions (and vague descriptions) of plant, working unsatisfactorily, to our own knowledge, in several establishments, and what may be considered public property, or else are crude ideas which could not possibly work in practice, as imagined by the essayists. We have, however, placed the competitors upon the free list for twelve months.

Trade Notes.

Birmingham Coal Contracts.—The Birmingham Gas Committee will pay about £40,000. more on its coal contracts for this year than it paid two years ago.

Papermakers and the Alkali Trust.—The Scottish papermakers, at a meeting held in Edinburgh, have agreed to appoint a committee to consult with experienced engineers and others with a view to ascertaining the cost of erecting works capable of supplying the whole of the paper trade in Scotland with caustic soda and bleaching powder. The proposed action is to check the operations of the Alkali Trust.

Proposed "Corner" in Anthracite Coal.—The *South Wales Daily News* announces a proposed combination of all the anthracite collieries in South Wales. The scheme provides that a company shall be established to buy up all the anthracite collieries in South Wales, paying one-half in cash, and one-half in shares, and that in this way full control of the whole output of anthracite shall be obtained. The annual output is about one and a quarter million tons.

The Late Mr. Alexander Parkes.—A long and useful life has been brought to a peaceful close. Mr. Alexander Parkes, who passed from time on the 29th ult., will be long remembered as a modest, unassuming, hard-working chemist, whose inventions had with scarcely an exception the characteristic feature that they were of great practical utility. We need only mention, Parkesine or Xylonite, Manganese German Silver, and Parkes' Zinc Desilvering Process, to prove this.

WILKE'S POLE-FINDING PAPER.—If a strip of this paper be moistened by the tongue or by water, and then be touched by the ends of two wires in which there is a difference of electromotive force, a red spot will appear at the point touched by the negative wire. This spot shows which wire should be connected to the lower carbon in an electric lamp, or to the article to be plated in a bath. The use of pole-finding paper will obviate mistakes in connecting up secondary batteries, and in many other ways. It forms a very portable detector.

THE PRICE OF PLATINUM.—Those of our readers who are in possession of old platinum crucibles have now a chance of selling. Owing as some say to an increased demand, or as others say to the existence of a platinum syndicate, the present price is more than double what it was a year or so ago, being for new platinum utensils £4. per ounce *troy*. We know of scrap sales having been recently effected at £2. 5s. per troy ounce. *Note*.—The troy ounce equals 31·1035 grammes, or 1·097 avdp. ounce.

OIL AS FUEL.—Rodefer Bros. have determined on putting in an oil attachment to their glass furnace, it having been demonstrated to them that a twelve pot furnace can be successfully run on 600 gallons of crude oil for twenty-four hours, with the proper appliances. The change and the machinery necessary will cost considerable, but it will be worth all the cost if it proves as successful and reliable as has been demonstrated to them, and there seems to be no good reason to doubt it. This will be much cheaper than gas has ever been here, and quite as good as when the gas was reliable.—*Wheeling Intelligencer*.

AN INGENIOUS DEVICE.—Mr. J. G. F. Rooker, writing to our contemporary "Engineering" on "Efficiency of Steam Jackets," gives the following on indicator diagrams: "Cards were taken every quarter of an hour and calculated by a planimeter. After some days a chemist of my acquaintance recommended the plan of weighing the cards on a chemical balance in order to determine the indicated horse-power. The cards being taken on absolutely the same paper, the lengths of the diagrams being all the same, this was tried. We first compared the results of weighing with that of the calculation by planimeter, the result was the same, and then adopted the weighing system throughout. Everyone knows that with good paper of the same thickness, once the weight of one square unit is determined, this gives the base for further calculation. The cards being cut during trials, all diagrams of one cylinder end are weighed in one operation. I dare say that it is the most pleasant way of determining the indicated horse-power, certainly accurate, and the average of the whole set of diagrams is as easily obtained as an average of part of the diagrams, and the sources of error are less than by any other mode of calculation."

GOOD WORK FOR A BESSEMER FURNACE.—The Carbon Iron and Pipe Company, Limited, of Parryville, Pa., is running Furnace No. 3, on Bessemer pig iron, for Messrs. Wm. R. Hart & Co., of Philadelphia, and the recent product has been somewhat remarkable from the fact that the iron combines extremely low silicon and low sulphur, which is rather unusual. Most furnaces find it quite easy to make low silicon or low sulphur, but find it difficult to combine these characteristics in the same iron. The following analyses show the results for 12 consecutive days' running, and are not selected specimens:—

Silicon.	Phosph.	Sulphur.	Silicon.	Phosph.	Sulphur.
1·055	·70	·015	·420	·065	·037
1·455	·070	·011	·455	·067	·027
1·350	·076	·009	·595	·065	·031
·930	·069	·025	·915	·069	·023
·515	·068	·022	1·195	·063	·018
1·180	·063	·006	1·235	·062	·006

This iron is known in the market as Parry pig, and its analysis makes it suitable for use in the open-hearth processes.

THE PATENT OFFICE LIBRARY.—There has just been issued from Her Majesty's Stationery Office a catalogue of the periodicals and transactions of scientific societies in the Patent Office Library, which has been compiled by Mr. H. T. Allison, the courteous librarian. The ground covered by these publications includes practically every branch of science, and their presence in the library is a great boon to the public, some of whom, however, are somewhat too enthusiastic in their appreciation of the periodicals to be seen there, and are in the habit of abstracting plates and exceptionally interesting papers in spite of the vigilance of the officials. These thefts are particularly annoying, as they not only rob the public of what has been provided for them from the public funds, but spoil the numbers for binding. By far the larger proportion of the periodicals are, we understand, purchased, comparatively few being presented to the library. At the end of Mr. Allison's catalogue we find a list of the home and foreign patent journals to be had at the library. This list should be particularly valuable to inventors. As for the get up of the catalogue it is, we think, somewhat superior to the general run of Government publications, both type and paper being very good.

NAME THE ANTIDOTE ON THE POISON LABEL.—A firm of chemists in Birmingham place upon all poisons sold by them directions as to the antidote which should be applied in cases where the poisons are taken accidentally or intentionally by human beings. The practice seems to be a good one; in one instance, at least, it has been of great service. A woman recently partook of a deadly poison, and afterwards informed her husband that "she had done it." A medical man was at once sent for, but the woman would in all probability have been dead ere he could have arrived, but for the fact that her husband came across the label which had accompanied the poison, and read thereon "Give a mixture of chalk and water, milk and magnesia, or carbonate of soda and water, until medical aid can be procured." As a result the would-be suicide is alive to-day.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

Alkali and kindred products have been steady during the past week. Arrangements for the formation of the union are reported to be progressing favourably and are nearly approaching completion. Bleaching powder has been selling freely at £5. 7s. 6d. to £5. 10s. per ton on rails at makers works, and the latter may be taken as the price now generally ruling. Caustic soda has been selling at prices recorded last week, and quotations are nominally the same, though for special lines rather lower prices will buy; the price of 77%, f.o.b. Tyne, is £10. 10s. nett. Soda ash keeps steady at 1¼d. to 1⅜d. per deg., f.o.b. Soda crystals are less plentiful and prices are £2. 17s. 6d. to £3., f.o.b., nett weights, for assorted casks. Recovered sulphur in bulk at makers' works, firm at £4. 2s. 6d. per ton, and in good demand. Muriatic acid and vitrol without change meantime. Sulphate of copper is in excess of requirements and price obtainable in small spot transactions is from £18. 10s. to £19. per ton. Curtailments of production are now recognised as necessary and are being effected in every direction. Brown acetate of lime has given way slightly, having been done at £7. 2s. 6d. to £7. 5s. per ton; grey steady at £12. 15s. to £13. Acetate of soda is firmer. Acetic acids without change. White powdered arsenic continues to find ready sale, and is firm at £13. 5s. to £13. 10s. at usual points for good Cornish brands. Carbolic acid crystals are steady at 7½d. to 7¾d. for 34/35°. Picric acid 1s. 1d. per lb. Muriate of ammonia quiet, and lower prices have been taken in some quarters to effect sales: current quotations are £22. 10s. to £23. at usual centres of consumption. Salammoniac firm and makers clear of stocks. Aniline salt and oil are firmer, and further advances may be looked for owing to the higher prices now ruling for Benzols. Potash, caustic and carbonate, are freely enquired for and makers are full of orders.

REPORT ON MANURE MATERIAL.

There has been a fair business doing during the week, and prices are very firm, though without advance on last quotations.

For Charleston River phosphate rock 11d. per unit, and for land rock 10d. per unit, now required for cargoes c.i.f. to U.K. There is more demand for Canadian rock, and closing values must be quoted at, 1s. 4d. for 80%, 1s. 2½d. for 75%, and 12½d. to 13d. for 70%, full delivered, terms ⅛th rise in each case. Quotations for Somme and Belgian are without change.

It is reported that a cargo of River Plate bones has been sold at £5. 10s. for U.K., for shipment ahead, and it is understood that this price has also been paid for a cargo of Salonica bones. Sales of crushed Kurrachee bones have been made at £5. 5s. ex quay, autumn shipment. We do not hear of any business in East Indian bone meal, the shippers holding off in anticipation of better prices later on. Spot value is £5. 10s. Common grinding bones are worth about £5. ex quay Liverpool, and up to £5. 7s. 6d. has been paid for some good hard cut Brazil bones.

The position of nitrate is without much change. Spot value is 8s. 3d. ordinary, 8s. 6d. for refined. Due cargoes are worth 8s. 3d. per cwt. Later shipments are worth 8s. 6d. to 8s. 9d., according to size of cargo and position, refined 3d. per cwt. extra.

Two cargoes of Liebigs products have been sold—a cargo of bone flour and meat meal—to the continent at £5. 10s. for flour, and 11s. 4d. and 1s. 6d. for the meat meal, full delivered terms, and a cargo of guano S. to U.K. at 11s. and 1s. 6d., buyers paying dues and landing charges.

There is nothing fresh to report in dried blood or ground hoof.

The unsettled weather seems to be keeping manure manufacturers back from making further purchases, prospects of farmers having been rendered much less hopeful than they were a short time back.

TAR AND AMMONIA PRODUCTS.

The benzol market continues to increase in firmness, and to-day's quotations may be mentioned as at least 4s. for 90s., and 2s. 11d. to 3s. for 50/90s. In some quarters even more than 4s. is quoted for 90s., but possibly this value is excessive. The demand for solvent naphtha still continues good at old rates, but creosote has fallen in value, notwithstanding the small quantity that is produced at this time of the year. Crude carbolic just about keeps its price, and the same may be said of anthracene. Pitch is weak, but at this time of the year it is very little business that is doing.

The sulphate of ammonia market is a little firmer, and there is an improved demand both for prompt and forward delivery. Beckton price is £11. 12s. 6d., and the value of London outside makes is £11. 10s. 0d. There is very little sulphate indeed offering, and at Hull values run from £11. 8s. 9d. to £11. 10s. 0d. for good grey, while sellers are asking £11. 10s. for forward delivery. There is a good demand at the Scottish ports, and £11. 7s. 6d. is now being obtained. New York has absorbed some considerable parcels of sulphate lately, which has, it is stated, gone for the production of liquid ammonia for the refrigerating machines in use there. From Hull, Liverpool, and Glasgow, considerable shipments have been made to New York.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron was steady, Scotch warrants closing at 45s. 10½d. cash and 46s. 0½d. one month. Middlesbrough warrants at 43s. 4d. cash, and Hematite warrants at 53s. 4d. cash. Copper was quiet: Chili bars, G.O.B.'s and G.M.B.'s closing at £57. 5s. to £57. 12s. 6d. cash and £57. 17s. 6d. to £58. 5s., three months. Tin was steady; Straits, £94. 5s. to £94. 15s. cash and £94. 5s. to £94. 15s. three months; English ingots, £98. Spanish lead, £12. 15s., English, £12. 17s. 6d. to £13. Spelter: Silesian ordinary £23. 10s. to £23. 12s. 6d. Quicksilver £10. 2s. second hands. Share quotations:—Cape Copper 4⅝ to 4¾; Copiapo 2$\frac{15}{16}$ to 3$\frac{1}{16}$; Mason and Barry 7⅛ to 7⅜; Namaqua 2⅜ to 2⅞; Rio Tinto 22$\frac{13}{16}$ to 22$\frac{15}{16}$; Tharsis 5$\frac{15}{16}$ to 5$\frac{15}{16}$.

GLASGOW, Wednesday.—Market firm with a good business. Scotch done at 45s. 10½d., 46s., and 45s. 11½d., cash, also at 46s., 46s. 1½d., and 46s. 1d. one month; closing buyers at 45s. 11d. cash, sellers ask ½d. more. Middlesbrough closes with buyers at 43s. 4d. cash, sellers ask 43s. 6d. Hematite done at 53s. 4d. cash, also at 53s. 6d. one month; closing buyers at 53s. 4d. cash and 53s. 6d. one month, sellers ½d. dearer.

WOLVERHAMPTON, Wednesday.—The chief event since last change has been the reduction in puddlers' wages of 3d. per ton, and of 2½ per cent in the wages of mill and forge men. This is because the recently declared average selling price of iron, for May and June, is only £7. 16. 5d., or a reduction of 8s. 6d. upon the average for March and April. An improved demand was reported to day for pigs, and also for sheet iron.

THE LIVERPOOL MINERAL MARKET.

Our market has been brisk, and prices have ruled strong during the week. Manganese: Arrivals have been somewhat above the average, but prices are unchanged both for spot and forward. Magnesite: The supply of raw lump is so largely in excess of the demand that prices are practically in the hands of buyers; raw ground, £6. 10s., and calcined ground, £10. to £11. Bauxite (Irish Hill brand): The mines are scarcely able to keep pace with the demand, and prices are firm: Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: Arrivals this week have somewhat increased, but prices are unaltered, especially for G.G.B. "Angel White" brand, 95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate) continues steady; selected crystal lump is scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; selected crystal ground, £8. Sulphate firm, best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.G.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumicestone quieter; ground at £10., and specially selected lump, finest quality, £13. Iron ore steady. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore easier. Spanish manganiferous ore in fair demand. Emerystone: Best brands in fair demand at good prices. No. 1 lump is quoted £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal, no alteration to report in prices, but the inquiry is continued. Chrome metal, 5s. 6d. per lb. Chrome ore best qualities offering freely, and prices easier. Antimony ore and metal in strong demand at high prices. Asbestos is in strong demand, especially rock and prices are strong. Potter's lead ore, firm; powdered, £15. 10s.; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Best qualities are scarce, 60s. to 80s. Strontia steady; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Bog ore in demand, firm, at 22s. to 25s. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, continues scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel more doing. Chrome iron unaltered at last quotations. Ground mica, £50. China clay: In view of the combination, prices are somewhat firmer—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn).

THE LIVERPOOL COLOUR MARKET.

Colours unchanged. Ochres: Oxfordshire has been quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc: V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Alkali prices still rule high, but the bulk of passing business is smaller, buyers and sellers both being inclined to wait further developments. In caustics the rise has been added to, but bleaching powder seems to have touched its top just for the time. There is great uncertainty as to the future, and the air is full of rumour and speculation. The Scotch papermakers are said to resent strongly the proposed syndicate, and to be making preparations against the necessity, which they foresee, of setting up works and manufacturing their own chemicals. Soda crystals, soda ash, saltcake, and nitrate of soda are all higher; and about the only receding chemical here is sulphate of ammonia, whose position, however, is not so clearly defined as it usually is. £11. 5s. is about the mark; but we hear that less than this has been acepted—this being balanced, on the other hand, by the attitude of certain sellers who are holding for something even over £11. 5s. In the paraffin section the position is unchanged, except in so far as it is now known for certain that at the next meeting of the Mineral Oil Association, timed for August 6th, the price of burning oil will be decided. At the same time it is also conjectured, and with nearly as much certainty, that there will be a drop from the present figure, as the only available measure whereby sales in satisfactory bulk may be produced. Chief prices current are:—Soda crystals, 53s. net Tyne; alum in lump £5., less 2½% Glasgow; borax, English refined, £29. 10s, and boracic acid, £37. 10s, net Glasgow; soda ash, 1⅛d. less 5%, Tyne; caustic soda, white, 76°, £12., 70/72°, £9. 17s. 6d., 60/62°, £9., and cream, 60/62°, £8. 12s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s, and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1½d., net Tyne; saltcake, 32s. 6d.; bleaching powder, £5. 10s. to £6. 2s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5 and 6% to Scotch and English buyers respectively (for export these prices net); chlorate of potash, 4⅞d. to 5d., less 5% any port; nitrate of soda 8s. 4½d.; sulphate of ammonia, £11. 5s. spot; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18, less 2½% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3½d.; paraffin spirit (naphtha), 7d. a gallon; paraffin oil (burning), 6¾d. to 7d. on rails Glasgow to all Scotch buyers (English orders negotiable about 1¼d. a gallon lower); ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 14,968 bags.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market continues very firm and steady, with little alteration from last week's prices. Soda crystals and soda ash are in good demand, the latter being a shade higher in price. Bleaching powder and caustic soda are firmly held at late quotations. Sulphate of soda continues quiet and unchanged in price.

The following are to-day's quotations:—Bleaching powder, in soft-wood casks, £5. 7s. 6d. per ton; in hardwood casks, £5. 12s. 6d. per ton, prompt delivery; and £5. 15s. to £6. per ton for August-September delivery; caustic soda, 77%, £10. 10s. per ton; ground and packed in 3-4 cwt. barrels, £13. 10s. per ton; soda ash, 48/52%, 1⅜d. per degree less 5%; soda crystals, in casks, £2. 13s. 6d. per ton, gross weight; in 2 cwt. bags, £2. 13s. 6d. per ton, nett weight; in 1 cwt. bags, £2. 16s. per ton, nett weight; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £5. 15s. per ton; in 5-7 cwt. casks, £5. 5s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

Small coals for manufacturing purposes are firm and in good demand, and higher prices are now being asked for superior qualities. Northumberland steam small quoted from 7s. to 7s. 6d. per ton, and Durham small from 7s. to 8s. per ton, according to quality.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

S. E. MORBY, and C. M PINCHIN, under the style of Pinchin and Co., Church-street, Bethnal Green-road, London, oil and colour men.

P. and J. LEICESTER, Rudheath and Winnington, brick and tile makers.

T. GELDART, and W. HUMPHREYS, under the style of T. Geldart, and also of T. Geldart and Co, Leeds, soft soap manufacturers.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Cement Making Machinery. N. W. Curtis and A. E Carey. 10,918. July 14.
Steam Boiler Level Indicator. W. Somers. 10,927. July 14.
Hardening Iron. H. A. van Vught. 10,940. July 14.
Plastic Building Compounds. R. G. de Vasson and the Société La Subérine. 10,962. July 14.
Utilization of Coal Tar. T. H. Davis and A. H. Davis. 10,976. July 15.
Treatment of Liquids. W. H. Watson. 10,990. July 15.
Waterproofing Paper. A. Morton and F. L. Leech. 10,992. July 15.
Explosive Compounds —(Complete Specification.) W. P. Thompson. 11,018. July 15.
Manufacture of Carbonate of Strontium. J. R. Wylde, M. J. Hammill, and H. Auer. 11,020. July 15.
Manufacture of Manilla Paper. J. B. Atherton. 11,021. July 15.
Non-conducting Coverings for Boilers, etc.—(Complete Specification). H. M. Hanmore. 11,027. July 15.
Electric Thermometers and Thermographs. J. W. Gooch, C. A. Baker, and W. White. 11,042. July 15.
Washing or Bleaching Apparatus.—(Complete Specification). M. L. W. Martinot. 11,044 July 15.
Apparatus for Heating and Settling Brine. P. P. Truehart and M. Stores. 11,046. July 15.
Treatment of Sewer Gases. T. Douglas. 11,048. July 15.
Preparation of Tartaric Acid. A. M. Clark. 11,057. July 15.
Impregnation of Cellular Matter by means of Electricity. G. A Oncken. 11,065. July 15.
Distillation of Mineral Oils. J. Laing. 11,079. July 16.
Distillation of Coal. W. R. Hutton. 11,091. July 16.
Gas Producers. J. E. Bott, W. Mortimore, and F. H. Lindley. 11,106. July 16.
Measuring Funnel. J. P. Bayly. 11,111. July 16.
Manufacture of Cement. J. Thomlinson. 11,115 July 16.
Grinding Machinery. C. William Kitto, C. Walter Kitto, and H. H. Kitto. 11,122. July 16.
Insulating Compounds. A. N. Ford. 11,130. July 17.
Smoke Consumption. J. Y. Johnson. 11,148. July 17.
do. J Day and Leedham and Heaton, Limited. 11,152. July 17.
Purifying Boiler Feed Water. C. De Kerpezdron and A. Gibault. 11,172. July 17.
Electro-deposition. A. W. Armstrong. 11,187. July 17.
Preparation of Peptone Compounds. W. R. Lake. 11,189. July 17.
Treatment of Blast Furnace or Coke Oven Oils. W. W. Staveley. 11,195. July 18.
Phosphated Salt. G. D. Bowie. 11,196. July 18.
Liquid Meters —(Complete Specification). P Tarda. 11,224. July 18.
Production of Malt. E. Craddock. 11,226. July 18.
Artificial Fuel. W. H. Buckland and G. Myers. 11,239. July 18.
Cooling Liquids by means of Air.—(Complete Specification). J. Klein. 11,246 July 18
"Pasteurising" Apparatus. A. Regel. 11,249. July 18.
Air Compressing Apparatus. W. Robertson and D. J. Macdonald. 11,262. July 19.
Steam Boiler Water Guage.—(Complete Specification). C. Weaver and W. C. Weaver. 11 268. July 19.
Armatures for Dynamos. J. Vanicombe 11,288. July 19.
Manufacture of Alkaline Carbonates and Bye-products. A G Haddock and J. Leith. 11,296. July 19.
Electric Welding. H. Howard. 11,319. July 19.
Stamping and Crushing Machines. C. T. J. Vautin. 11,327. July 19.
Elimination of Sulphur from Pig Iron. Gustav Hilgenstock and Joseph Massenez, trading as Hoerder Bergwerks and Hütten Verein. 11,328. July 19

New Companies.

BRILLIANT LIGHT COMPANY, LIMITED.—This company was registered on the 21st inst., with a capital of £15,000., in £1. shares, to acquire certain inventions, also letters patent in respect thereof, granted to Sir James Nicholas Douglass; and further, an invention in burners, and the letters patent granted to the Patent Argand Gas and Oil Burners Company, Limited, and R. T. Strangman, and to carry on the business of gasfitters, lamp manufacturers, &c. The subscribers are:—

	Shares.
Wm. Tully, 58, Gurney-road, Leytonstone, engineer	1
H. Verden, 14, Gt. Winchester-street, solicitor	1
A. W. Kerly, 14, Gt. Winchester-street, solicitor	1
W. A. Granger, 15, Foulden-road, N., engineer	1
J. Taylor, 17, Baches-street, Hoxton, brass finisher	1
J. Bateman, 20, Clarence-street, Clapham, carpenter	1
J. Cobett, 96, Farringdon-road	1

CRYERS OXYGEN COMPANY, LIMITED.—This company was registered on the 18th inst., with a capital of £1,100., in £1. shares, to carry on business as patentees and proprietors of patents. No particular patent or invention being referred to in the Company's Memorandum of Association. The subscribers are:—

	Shares.
W. G. H. Monypenny, Hadlow, Kent, clerk	1
W. Cryer, 54, Tustin-street, S E., engineer	1
J. E. Howard Monypenny, Hadlow	1
J. Richard, 32, Oval-road, Clapham-road, clerk	1
W. Outtrim, 5, Lawley-street, Lower Clapton, clerk	1
H. E. Harman, 10, Fitzroy-square, clerk	1
W. E. Geach, 13, Lovell's-court, E.C., printer	1

DIEPPE PULP AND PAPER MILLS COMPANY, LIMITED.—This company was registered on the 15th inst., with a capital of £25,000., in £1. shares, to acquire the pulp mill known as the Usine de Bonne Nouvelle Les Dieppe, upon the terms of a judgment of sale by auction, given at the sitting of the Civil Tribunal of Dieppe, on 14th June. The subscribers are:—

	Shares.
J. J. Ball, 1, Gresham-buildings, E.C., chartered accountant	1
W. E Rowe, 1, Gresham-buildings. E.C., chartered accountant	1
C. E. Riddell, 4, Clarendon-villas, Putney, S.W., articled clerk	1
M. Heildesheim, 13, Lyndhurst-gardens, N.W., clerk	1
C. W. Cornish, 34, South Hill-park, Hampstead, N.W., chartered accountant	1
H. Thirkettle, 5, Middleton-buildings, Islington, clerk	1
C. C Baker, 1, Gresham-buildings, E.C., chartered accountant	1

EAST MIDDLESBOROUGH SALT COMPANY, LIMITED.—This company was registered on the 22nd inst., with a capital of £40,000, in £10. shares, to carry on business as salt producers, proprietors, and manufacturers, and for such purposes to adopt an unregistered agreement of the 21st inst., with Arthur Burrell. The subscribers are:—

	Shares.
W. Waymark, 53, King-street, Camden Town	1
W. Blaxall, 40, Alexandra-road, N.	1
C. B. Hardment, 10, Pool's-park, N.	1
C. W. Hardment, 38, Dunford-road, N.	1
C. M. Gould, 34, Whittington-villas, N.	1
F. McCartney, 14, Albert-street, Islington	1
A. F. Forward, 18, Kingsgate-street, Bloomsbury	1

EARTHY METALS COMPANY, LIMITED.—This company was registered on the 19th inst, with a capital of £2,000., in £50. shares, to manufacture and prepare for market, sodium, potassium, magnesium, aluminium, and other metals. The subscribers are:—

	Shares.
Major J. G. Scott, Winkfield, Berks	1
A. Cadogan, 3, Sloane-gardens	1
J. M. Maclean, M.P., 40, Nevern-square, S.W.	1
J. W. Macfarlane, 2, Lexham-gardens..	1
Henry Wilson, 15, Campden-hill-gardens, W.	1
R. St. John Boddington, 15½, Parliament-street	1
H. M. Cadell, Grange, Bo'ness, N.B.	1

HITCHIN GAS COMPANY, LIMITED.—This company was originally registered under the Companies' Acts, 1856 and 1857, on the 2nd November, 1857, and was registered as a limited company on the 21st inst. The nominal capital is £7,000., divided into 272 shares of £20. each, 25 shares of £10. each, 29 shares of £8. each, 2,000 shares of £5. each, 39 shares of £2. each, all of which are taken and are fully paid. Registered office, Gas Works, Hitchin, Herts.

IMPERVISINE COMPANY, LIMITED.—This company was registered on the 22nd inst., with a capital of £20,000., in £10. shares, to carry on the business of chemical manufacturers and waterproofers, and with such objects to adopt an unregistered agreement of 18th inst. The subscribers are:—

	Shares.
A. G. Morton, 29, Pandora-road, West Hampstead, architect	1
H. Tanner, 2, St. Oswald-road, West Brompton, Government examiner in science	1
A. Morten, 17, St. Oswald-road, West Brompton, director of a company	1
Mrs. F. Peck, 17, St. Oswald-road, West Brompton	1
J. E. Cracknell, 9, Victoria-street, S.W., emigration agent	1
F Bassett, 7, Stannier-street, Battersea-park, clerk	1
W. Harris, 136, Drayton-park, N.	1

Indian Mechanical Gold-Extracting Company, Limited.—This company was registered on the 22nd inst., with a capital of £50,000., in £1. shares, to carry into effect an agreement made 19th July between Middleton Crawford, of the one part, and Thomas Ball, F. Andrew, John Richardson, and Septimus Lowe, as trustees on behalf of the company, of the other part; to acquire any patents, patent rights, concessions, etc, relating to the separation of gold and other metals from crushed or divided ore, granted or to be granted to Middleton Crawford. The first subscribers are:—

	Shares.
Middleton Crawford, 127, New Bond-street, W., engineer	1
B. F. Watkins, 127, New Bond-street, W.	1
T. Bell, Normandy-house, Lincoln, engineer	1
F. Andrew, 138, High-street, Lincoln, solicitor	1
J. Richardson, Lincoln, engineer	1
S. Lowe, St. Mary's-street, Lincoln	1
A. Trotter, Staniston-street, Newport, Lincoln, solicitor	1

MacIvor's Patents, Limited.—This company was registered on the 18th inst with a capital of £250,000., in £2. shares, to acquire certain letters patent granted to Ralph Waldo Emerson MacIvor, and others, Nos. 10,426 of 1888 and 6,815 of 1889; to carry on the business of chemists, drysalters, oil and colourmen, importers and manufacturers of, and dealers in, chemical and other preparations and articles, compounds, cements, varnishes, &c. The first subscribers are:—

	Shares.
J. Jepson Atkinson, Osgrove Priory, Northamptonshire, barrister	500
H. W. Christmas, 42, Bloomsbury-square, W.C.	500
Dr. L. Grant, 9, Western-villas, New Southgate	500
J. T. Cooper, Cregg, Nightingale-lane, S.W., merchant	500
J. A. Ewen, 11, Bunhill-row, E.C., merchant	500
H. O. White, Homehurst, North Bank, N.W.	500
W. Elmore, 47, Clapham-road, S.W., electro metallurgist	500

Process Syndicate, Limited.—This syndicate was registered on the 22nd inst., with a capital of £50,000., in £5. shares, to acquire and work inventions relating to the producing or treating of oils, and similar products. The subscribers are:—

	Shares.
A. Stuart, 32, Great St. Helen's, shipbroker	1
S. Neave, 7, Great St. Helen's, shipbroker	1
W. C. Boniface, Claremont-house, Clapton, clerk	1
W. F. Morse, 185, High-street, Lewisham, clerk	1
A. G. Parker, Albion-cottage, Loughton, clerk	1
G. P Cawston, Chigwell, clerk	1
J. W. Salton, 32, Great St. Helen's	1

Syddall Bros., Limited.—This company was registered on the 17th inst., with a capital of £30,000., in £5. shares, for acquiring the business of bleachers, dyers, printers, and finishers, and other auxiliary businesses heretofore carried on by James Syddall, at Chadkirk, Romiley, in the county of Chester, under the style or firm of Syddall Bros. The first subscribers are:—

	Shares
J. Syddall, Orange Tree House, Romiley, Chester	5
J. L. Syddall, Roseleigh House, Chadkirk, Chester	5
R. J. Syddall, Roseleigh House, Chadkirk, Chester	5
J. L. Syddall, Roseleigh House, Chadkirk, Chester	5
J. Whittaker, Bredbury Vicarage, Stockport, Chester	5
L. E. Syddall, Roseleigh House, Chadkirk, Chester	5
M. A. Drinkwater, The Crescent, Brunnington, Stockport, Chester	5

IMPORTS OF CHEMICAL PRODUCTS

AT

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending July 19th.

Acetic Acid—

Holland,	100 pks.	Beresford & Co.

Ammonia—

U. S.,	£350	A. Clive & Co.
,,	20	Walsh, Lovett & Co.

Antimony Ore—

Sydney,	25 t.	L. & I. D. Jt. Co
,,	32	Pillow, Jones & Co.
Maryboro',	6	Vivian, Younger & Co.
Melbourne,	23	Knight & Morris
Sydney,	8	H. Bath & Son
,,	9	Cotesworth & Powell
Spain,	1	Jose, Ford & Co.
N. Zealand,	31	F. Manders
Portugal,	14	H. Emanuel
France,	20	H. R. Merton & Co.

Borax—

Germany,	£29	F. Stahlschmidt & Co.

Bones—

Sydney,	12 t.	Goad, Rigg & Co.
Melbourne,	15	Dyster, Nalder & Co.
U. S.,	23 t.	Hicks, Nash & Co.

Brimstone—

France,	13 t.	F. Griffin, Junr.
Italy,	150	B. Jacob & Sons

Barytes—

Holland,	20 cks.	H. Hodson & Co.
,,	39	Magee, Taylor & Co.
,,	21	O'Hara & Hoar
Germany,	23	,,

Barium Chloride—

Germany,	£70	Petri Bros.

Caustic Potash—

France,	21 pks.	F. W. Berk & Co.
Holland,	16	Spies Bros. & Co.

Copperas—

Germany,	£50	Burgoyne, Burbidge & Co.

Cobalt Ore—

Sydney,	45 t.	Watt, Gilchrist & Co.

Caoutchouc—

Singapore,	30 c.	Jackson & Till
U. S.,	28	Kebbel, Son & Co.
France,	7	Flageollet & Co
Tamatave,	7	Dronlenvaux & Bremner
Zanzibar,	142	L. & I. D. Jt. Co.
Savanilla,	7	Schloss Bros.
Zanzibar,	32	L & I. D. Jt. Co.
Inbambane,	18	,,
E. Indies,	94	Matheson & Co.
Penang,	72	T. Merry & Son
,,	91	N. S. S. Co., Ltd.
Singapore,	348	Huttenbach & Co.
,,	170	Kleinwort, Sons & Co.
Cape,	11	L. & I. D. Jt. Co.
Germany,	4 c.	Lavington Bros.
E. Indies,	26	Wallace Bros.
Zanzibar,	2 c.	Lewis & Peat

Cream of Tartar—

France,	10 pks.	B. & F. Wf. Co., Ltd.
,,	10	C. F. Gerhardt
,,	13	W. C. Bacon & Co.
Spain,	11	,,
,,	18	B. & F. Wf. Co., Ltd.
,,	10	C. Christopherson & Co.
,,	6	F. Smith
,,	2	Evans, Lescher & Co.
,,	5	L. & I. D. Jt. Co.

Copper Sulphate—

Germany,	£200	Hernu, Peron & Co.

Chemicals *(otherwise undescribed)*

Holland,	£15	Phillipps & Graves
France,	8	T. Ronaldson & Co.
Germany,	70	T. H. Lee
,,	40	Phillipps & Graves
,,	30	A. & M. Zimmermann
,,	9	T. H. Lee
Holland,	40	Spies Bros. & Co.
,,	20	J. Owen
Germany,	£1 100	A. & M. Zimmermann

Dyestuffs—

Indigo

E. Indies,	7 chts.	L. & I. D. Jt. Co.
,,	31	,,

Anthracene

Holland,	52 cks.	Burt, Boulton & Co.
,,	51	Little & Johnson
France,	22	Burt, Boulton & Co.

Cochineal

Canaries,	5 pks.	Swanston & Co.

Turmeric

E. Indies,	168 pks.	R. Warner & Co., Ltd.

Argols

France,	21 pks.	N. S. S. Co., Ltd.
Italy,	397	B. Jacob & Sons

Tanners' Bark

Sydney,	114 t.	
Melbourne,	319	Elkan & Co.
,,	15	Leach & Co.
,,	170	Baxter & Hoare
,,	153	Beresford & Co.
Holland,	25	J. G Fisher & Co.
Sydney,	32	Baxter & Hoare
Adelaide,	249	,,
Auckland,	10	W. H. Boult
Holland,	40	J. J Williamson & Son
U. S.,	10	Bailey & Leetham
,,	14	G. B. Mackereth
Melbourne,	102	Union L. Co., Ltd.

Madders

N. Russia,	11 pks.	Ross & Deering

Extracts

U. S.,	6 pks	W. Burton & Sons
,,	300	T. Ronaldson & Co.
France,	285	L. J. Levinstein & Sons
,,	50	,,
Germany,	15	H. Lambert
Spain,	9	J. M. Wimble
France,	10	L. J. Levinstein & Sons

Gutch

Holland,	2 pks.	Fuerst Bros

Sumac

Italy,	200 pks	W. Shelcott
,,	200	Hicks, Nash & Co.
,,	700	J. Kitchin, Ltd.
,,	900	Beresford & Co.
,,	200	W. France & Co.

Gambier

Holland,	91 pks.	Darling Bros.
Singapore,	212	Brinkmann & Co.
,,	1,823	R. & J. Henderson
,,	1,297	L. & I. D. Ji. Co.
,,	2,485	W. H. Cole & Co.
,,	426	Williams, Torrey & Co.
,,	421	Adamson, Gilfillan & Co.
,,	732	L. & I. D Jt. Co.
E. Indies,	133	,,

Myrabolams

E. Indies,	270 pks.	Marshall & French
,,	800	Union L. Co., Ltd.
,,	160	L. & I. D. Jt. Co.
,,	1,335	Beresford & Co.
,,	744	Leach & Co.

Safflower

E. Indies,	2 pks.	Brown & Elmslie

Dyestuffs *(otherwise undescribed)*

Germany,	45 cks.	Fleming's O. & C. Co., Ld.
France,	40 t.	L. & I. D. Jt Co.

Glycerine—

Germany,	£100	H. Lambert
,,	40	Beresford & Co.
Holland,	450	Spies Bros. & Co.

Glucose—

Germany,	10 pks.	70 cwts.	G. Hepke
,,	26	240	Fellows, Morton & Co.
,,	65	520	T. M. Duche & Sons
,,	25	200	C. Smith
,,	20	160	L. Sutro & Co.
U.S.,	250	1,338	,,
,,	40	224	Page, Son & East
France,	100	100	Seaward Bros.
U.S.,	265	1,590	T. M. Duche & Sons
,,	25	140	T. H. Dee
,,	25	150	Union Lighterage Co. Ltd.
Germany,	50	410	J. Knill & Co.
,,	350	340	Trier, Meyer & Co.
,,	103	830	L. Sutro & Co.
,,	5	40	Anderson, Becker & Co.

Glucose *—continued.*

U.S.,	50 pks.	300 cwts.	T. M. Duche & Sons
,,	17	102	R. G. Hall & Co.
,,	240	240	Botolph & Nich.'s W'vs. Co.
Germany,	20	100	Botolph & Nich.'s W'vs. Co.
U.S.,	200	1,142	A. Lyle & Sons
,,	50	277	Union Lighterage Co. Ltd.
,,	1,000	1,000	Union Lighterage Co. Ltd.
Germany,	5	40	M. D. Co.
,,	8	8	R. E. Drummond & Co.
,,	200	200	J. F. Ohlman
France,	302	300	J. Barber & Co.
,,	100	100	Dutrulle, Solomon & Co.
,,	200	200	De Paiva, Norman & Co.

Gutta Percha—

Singapore,	248 c.	Kaltenbach & Schmitz
,,	197	Huttenbach & Co.
,,	830	Kleinwort, Sons & Co.
,,	180	J. H. & G. Scovell
,,	19	Soundy & Son
,,	128	Cundall & Co.
,,	750	H. W. Jewesbury & Co.
,,	620	Kleinwort, Sons & Co.
,,	3	T. H. Lee

Isinglass—

Penang,	18 pks.	L. & I. D. Jt. Co.
N. Russia,	6	J. Vickers

Manure—

Holland,	300 t.	Anglo Cntntl. G. Works
Sydney,	3	Goad, Rigg & Co.
Germany,	50	Perkins & Homer
France,	150	Lawes Manure Co Ltd.

Phosphate Rock

Montreal,	225 t.	A. Hunter & Co.
,,	150	,,
U.S.,	10	M. D. Co.
Portugal,	1	L. & I. D. Jt. Co.

Naphtha—

Holland,	88 drs	Burt, Boulton & Co.
,,	88	Little & Johnston
Germany,	11	Stein Bros.

Nitroxylol—

Belgium,	£24	H. Birdseye & Co.

Potassium Sulphate—

Germany,	10 pks.	Howards & Son

Potassium Carbonate—

Holland,	28 pks.	Spies Bros. & Co.
France,	1	Beresford & Co.

Pyrites—
Spain, 2,073 t. C. Tennant, Sons & Co.

Potash—
Germany, 12 pks. M. D. Co.
" 508 J. Jensen & Co. Ltd.

Plumbago—
Germany, 28 cks. Brown & Elmslie
France, 2 Hernn. Peron & Co.
E. Indies, 76 brls. Doulton & Co
Holland, 3 cks. Brown & Elmslie
France, 1 Hernn, Peron & Co.

Pitch—
Germany, 49 brls. C. B. Leighton
" 45 Fellows & Co.

Pearl Ashes—
France, 210 c. F. W. Berk & Co.
" 80 Petri Bros.

Paraffin Wax—
Germany, 61 cs. Price's Patent Candle Co.
U.S., 60 H. Hill & Sons
" 60 brls. "
" 560 "

Sodium Sulphate—
Germany, 80 pks. Beresford & Co.
Holland, £31 Wallace & Co

Sugar of Lead—
Holland, 15 pks. Beresford & Co.

Stearine—
Belgium, 151 bgs. H. Hill & Sons
" 125
" 62 W. Balchin
Holland, 4 cks. Perkins & Homer

Sodium Acetate—
France, 9 pks. Prop. Hays' Wf.

Saltpetre—
Germany, 68 cks. J. Hall & Son
" 118 P. Hecker & Co.
E. Indies, 1,260 bgs. Ralli Bros.
" 630 Clift, Nicholson & Co.
" 521 C. Wimble & Co.
" 613 "
" 1,137 "
Belgium, 100 T. P. Lee

Tartaric Acid—
Germany, 20 pks. O. Andrae & Co.
Holland, 8 Middleton & Co.
" 4 B. & F. Wf. Co. Ltd.
France, 10 "
Holland, 24 "
" 2 "
" 17 H. Lorenz

Tar—
France, £27 McKellar & Co.
" 350 brls. Burt, Boulton & Co.
Uleaborg, 591 300 ½-brls. W. F. Malcolm & Co.
N. Russia, 400 100 Hoar, Marr & Co.

Turpentine—
France, 50 brls. J. Watt & Son

Tartars—
Italy, £1,400 Thames S. Tug Co.

Ultramarine—
Belgium, 5 cks. Leach & Co.
Holland, 5 Phillipps & Graves
" 8 Ohlenschlager Bros
Belgium, 4 Leach & Co.
Germany, 16 pks. H. Brooks & Co.
" 2 cs. L. & I. D. Jt. Co.

Zinc Oxide—
Holland, 300 cks. Soundy & Son
" 60 brls. M Ashby, Ltd.
U.S., 100 "

LIVERPOOL.

Week ending July 22nd.

Antimony Ore—
Smyrna, 953 bgs.
Cagliari, 221 J. Bacon, Ltd.

Antimony—
Oporto, 33 cks.

Acetate of Lime—
New York, 921 bgs.

Bones—
Campana, 92 bgs.
New York, 292
Alexandria, 1,155
Boston, 270 sks. J. Cordon & Co.

Borate of Lime—
Valparaiso, 1,280 bgs.

Barytes—
Rotterdam, 11 cks.
Antwerp, 6

Cream of Tartar—
Tarragona, 5 cks. Sachse & Klemm

Caoutchouc—
Addah, 9 pns. 6 brls. 2 bts. F. & A. Swanzy
" 1 brl 1 cs. J. H. Rayner & Co.
" 2 5 Pickering & Berthoud
" 6 2 J. P. Werner
Salt Pond, 3 1 cks. A. Miller, Bros., & Co.
" 1 Tomlinson & Co.
" 1 Havard & Co.
" 1 25 Radcliffe & Durant
" 1 1 F. & A. Swanzy
" 1 N. P. Nathan
" 1 Edwards Bros.
" 1 W. Griffiths & Co.
Antwerp, 16 bls.
Accra, 4 brls. Hutton & Co.
Cape Coast, 3 Mordaunt Bros.
" 1 L. Hart & Co.
" 2 E. J. Gunnell
" 1 A. Millerson & Co.
Chama, 1 A. Reis
" 1 ck. Pitt, Bros., & Co.
Half Jack, 1 Rider, Son, & Co.
Grand Bassa, 1 Brierley & Co.
" 1 H. S. Attia & Bros.
Sierra Leone, 34 pns. Broadhurst, Sons, & Co.
" 5 Pickering & Berthoud
" 11 Paterson, Zochonis, & Co.
" 2 A. Kinder & Co.
" 32 4 pns.
Bathurst, 8 cks. Cie Francaise
" 2 2 A. Cros & Co.
" 1 cs. J. Smith
New York, 50 brls. Pickford & Co.

Copper Ore—
Montreal, 150 t. A. Baker
Sestri Levante, 1,064 H. Balls & Sons

Chemicals *(otherwise undescribed)*
Hamburg, 1 ck.

Dyestuffs—
Valonia
Constantinople, 198 bgs. A. Papazoglu
" 826 bls.
Smyrna, 1,549 bgs. 7,620 kntls.
Saffron
Valencia, 1 cs.
Myrabolams
Calcutta, 2,762 pkts.
Cochineal
Gr. Canary, 11 bgs. Widow Duranty & Son
" 3 G. Belzold & Co.
" 2 J. Goddard & Co.
Extracts
Antwerp, 7 cs. J. T. Fletcher & Co.
Colon, 100 E. M. Chesney & Co.
New York, 43 brls. 25 bxs.
Divi Divi
Havre, 149 bgs. Cunard S. S. Co., Ld.
Sumac
Palermo, 575 bls.
" 100 bgs. J. Kitchen & Co.
" 100 H. Rooke, Son, & Co.
" 150

Glycerine—
Bordeaux, 128 cks. G. G. Blackwell

Glucose—
New York, 36 brls.
Philadelphia, 50

Litharge—
Rotterdam, 7 cks.
" 20 hds.

Manganese Ore—
Gothenburg, 200 t. Macqueen Bros.
Coquimbo, 1,196

Manure—
Phosphate Rock
Beaufort, 630 t.

Pyrites—
Huelva, 1,265 t. Tennants & Co.
" 850 "
" 1,627 Matheson & Co.

Pitch—
Rotterdam, 55 cks.

Potash—
Rotterdam, 4

Phosphate—
Montreal, 450 t. Wallace Bros.
Ghent, 600 bgs.
Montreal, 200

Potassium Muriate—
Hamburg, 2,389 bgs.

Stearine—
Antwerp, 13 bgs. J. T. Fletcher & Co.
" 39
" 14

Saltpetre—
Calcutta, 1,313 bgs. Ralli Bros.
" 526
Hamburg, 54 cks.

Soda—
Alexandria, 1 brl. F. Leyland & Co.

Tartar—
Bordeaux, 6 cks. G. G. Blackwell

Tartaric Acid—
Rotterdam, 1 cs. 7 cks.

Turpentine—
Savannah, 500 brls

Ultramarine—
Rotterdam, 5 cs.

Zinc Oxide—
Antwerp, 80 brls.
" 100 25 cks.

Zinc Ashes—
New York, 12 brls. R. Crooks & Co.
Montreal, 133

HULL.

Week ending July 24th.

Acids *(otherwise undescribed)*
Rotterdam, 2 cs. G. Lawson & Sons

Ammonia—
Rotterdam, 1 ck. Hutchinson & Sons

Barytes—
Rotterdam, 6 cks.
Antwerp, 5 Bailey & Leetham
" 86 H. F. Pudsey
" 100 Storry, Smithson & Co.
Bremen, 23 cks. Tudor & Sons

Caoutchouc—
Christiania, 1 brl. Wilson Sons & Co.
New York, 12 cs. "

Chemicals *(otherwise undescribed)*
Antwerp, 6 pks. Wilson Sons & Co.
Hamburg, 8 cks. "
Stettin, 42 pks. "
Rotterdam, 22 cks. W. & C. L. Ringrose
Hamburg, 2 cs. Wilson Sons & Co.
Bremen, 1 bkt. 3 cs. Veltmann & Co.
Rotterdam, 1 Hutchinson & Son
Dunkirk, 67 pks. Wilson Sons & Co.
" 10 cks.

Dyestuffs—
Rennett
Rotterdam, 2 cks. G. Lawson & Sons
Logwood
Boston, 250 bxs. Wilson, Sons & Co.
Alizarine
Rotterdam, 6 pks. W. & C. L. Ringrose
" 29 W. & C. L. Ringrose
" 76 cks. Hutchinson & Son
" 30 "
" 58 pks. W. & C. L. Ringrose

Glucose—
Hamburg, 10 cks.
Stettin, 1,211 bgs. C. M. Lofthouse & Co.
" 40
Hamburg, 25 cks.
" 100 bgs.
Rotterdam, 50 bgs. Hutchinson & Son

Glycerine—
Amsterdam, 5 pks.

Litharge—
Antwerp, 4 brls. Bailey & Leetham

Muriate—
Rotterdam, 44 cks. G. Lawson & Sons

Phosphate—
Ghent, 160 t. Wilson, Sons & Co.

Pitch—
Hamburg, 60 brls. W. Jackson & Son
Dunkirk, 43 cks. Wilson, Sons & Co.
Archangel, 100 brls.
Antwerp, 10 cks. H. F. Pudsey

Stearine—
Rotterdam, 55 bls. G. Lawson & Sons
Antwerp, 10 cs.

Saltpetre—
Rotterdam, 135 bgs. Wilson, Sons & Co.

Soda—
Hamburg, 105 kgs. Lofthouse & Saltmer

Salt—
Hamburg, 508 bgs. Furley & Co.

Turpentine—
Bordeaux, 240 brls.
Savannah, 1,620 brls.
Libau, 101 brls.

Tar—
Stockholm, 10 brls. Wilson, Sons & Co.
" 100 Good, Flodman & Co.
Archangel, 4,260
" 2,430 brls.

Zinc Sulphate—
Rotterdam, 5 cks. Hutchinson & Son

TYNE.

Week ending July 23rd.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.

Barytes—
Rotterdam, 75 cks. Tyne S. S. Co.

Copper Precipitate—
Pomaron, 3,701 bgs. Mason & Barry

Manganese Ore—
Antwerp, 260 t.

Sulphur Ore—
Pomaron, 1,052 t. Mason & Barry

Ultramarine—
Rotterdam, 2 cks. Tyne S. S. Co.

GRIMSBY.

Week ending July 19th.

Albumen—
Antwerp, 9 pks.

Glucose—
Hamburg, 45 pks.

Zinc Ashes—
Antwerp, 6 cks.

GOOLE.

Week ending July 16th.

Alum—
Rotterdam, 15 cks.

Antimony—
Boulogne, 2 cks.

Creosote Salts—
Rotterdam, 35 cks.

Caoutchouc—
Boulogne, 5 cks.

Dyestuffs—
Alizarine
Rotterdam, 89 cks.
Logwood
Monte Christi, 372 t.
Savannah-la-Mar, 500
Dyestuffs *(otherwise undescribed)*
Boulogne, 10 cks. 21 cs. 4 pks.

Glycerine—
Rotterdam, 2 drums.

Glucose—
Hamburg, 40 bgs. 25 cks.

Muriate—
Rotterdam, 31 cks.

Phosphate—
Ghent, 800 bgs.

Potash—
Dunkirk, 15 cks.

Saltpetre—
Rotterdam, 100 bgs.

Waste Salt—
Hamburg, 447 t. 1,128 bgs.
" 330 1,416 cks.

GLASGOW.

Week ending July 24th.

Barytes—
Rotterdam, 20 cks.

Dyestuffs—
Alizarine
Rotterdam, 185 cks. 1 bx.
Extracts
Antwerp, 1 ck.
Madders
Rotterdam, 2 cks. J. Rankine & Son

Glycerine—
Bombay, 1 cs
Hamburg, 60 drums.

Gutta Percha—
Amsterdam, 3 bgs.

Potash—
Rotterdam, 19 cks. J. Rankine & Son

Phosphate—
Montreal, 200 t.

Phosphate of Lime—
Antwerp, 100 t.

Saltpetre—
Hamburg, 120 kgs. 96 cks.

Tartar—
Bordeaux, 2 cks. 1 bg. J. & B. Hutchinson
" 5

Ultramarine—
Rotterdam, 10 cs. J. Rankine & Son
" 4 cks. "

Zinc Oxide—
Rotterdam, 214 cks.
Antwerp, 160 pks.

EXPORTS OF CHEMICAL PRODUCTS

LONDON.

Week ending July 16th.

Alum—
Salonica, 20 t. £100

Acid *(otherwise undescribed)*
Cologne, 250 btls. £400
St. Petersburg, 100 cs. 250

Arsenic—
Wellington, 1 t. 10 c. £21

Acetic Acid—
Wellington, 4 t. 13 c. £107
Lyttleton, 2½ 16

Ammonium Carbonate—
Adelaide, 3 c. £5
New York, 88 pks. 165
Sydney, 15 cs. 27

Ammonium Phosphate—
Canaria, 1 t. 10 c. £15

Ammonium Sulphate—
Le Treport, 30 t. £350
Demerara, 50 1 c. 598
Hamburg, 20 3 220
Amsterdam 50 600
Rotterdam, 35 420
Canaria, 5 62

Baryta Nitrate—
Naples, 1 t. £20

Bisulphide of Carbon—
New Orleans, 5 t. 4 c. £114

Brimstone—
Demerara, 4 t. 10 c. £29

Cream of Tartar—
Sydney, 10 c. £51
Melbourne, 1 t. 1 109
Lyttleton, 1 10 168
Adelaide, 10 56
Melbourne, 1 110
Townsville, 3 16

Caustic Soda—
Lyttleton, 8 t. 9 c. £70
Mauritius, 7 5 91
Algoa Bay, 1 10 84
Lyttleton, 15 2 127
Adelaide, 15 133

Carbolic Acid—
Sydney, 59 cs. £37

Carbolic Solid—
Genoa, 10 c. £47
Hamburg, 8 29
,, 7 16

Copper Sulphate—
Ghent, 5 t. £110
Salonica, 2 1 c. 43
Adelaide, 5 110
,, 7 10 155
Bordeaux, 6 150
Odessa, 3 70
Rotterdam, 10 220
Antwerp, 10 220
Odessa, 1 21

Citric Acid—
Moscow, 2 t. £277
Lisbon, 4 kgs. 28
Rotterdam, 2 c. 14
Danzic, 1 9
Hamburg, 15 100
Rotterdam, 1 ck. 18
Algoa Bay, 1½ 11
Seville, 5 35
Genoa, 10 70
Hamburg, 39
Canterbury, 1 8
Brussels, 5 37
Genoa, 1 148
St. Petersburg, 8 55
Amsterdam, 2 kgs. 14
Hamburg, 5 1 74

Coal Products—
Pitch
Antwerp, 271 t. £356
Melbourne, 30 brls. 20
Odessa, 400 100
Boston, 5 cs. 10
Madras, 45 rlts. 31
Alexandria, 200 60
Benzole
Calais, 40 cks. 5 pns. £784
Rotterdam, 20 321
,, 20 20 677
,, 62 841
Anthracene
Dusseldorf, 67 cks. £371
Rotterdam, 16 370
,, 150 1,000
Dusseldorf, 113 625
Naphthaline
Boston, 23 cks. £49
Rotterdam, 19 24
Naphtha
Calais, 10 pns. 996 gls. £87
Carbolic Acid
Paris, 2 cks. £18
Treport, 20 34
Creosote
Bordeaux, 800 cks. £500

Chemicals *(otherwise undescribed)*
Melbourne, 20 kgs. £125
Hong Kong, 3 cs. 62
Singapore, 13 124
Hong Kong, 7 pks. 74
Melbourne, 20 125

Disinfectants—
Hamburg, 5 cks. 50 bgs. £180
Paris, 600 gls. 40

Guano—
Demerara, 40 t. £400
Bluff, Hr. 20 200

Manure—
Demerara, 25 t. £294
Gothenburg, 267 11 c. 1,230
Palma, 4 1 45
Cologne, 32 376
Bordeaux, 35 230
Barbadoes, 3 36
Colberg, 177 8 819
Newfairwater, 225 t. 1 c. 787

Oxalic Acid—
Brisbane, 13 c. £21

Potassium Chlorate—
Shanghai, 2 t. £83

Phosphoric Acid—
Demerara, 3 t. £48

Potash Crystals—
Brussels, 1 cs. £16
New York, 5 pks. 20

Potassium Bichromate—
Dunkirk, 1 t. 15 c. £70
Otago, 15 27

Potash—
Brisbane, 1 t. 13 c. £39
Gothenburg, 5 11
Melbourne, 1 42
Gothenburg, 5 11

Strontium Nitrate—
Naples, 1 t. 5 c. £38

Sulphur—
Calcutta, 21 t. 6 c. £117
Pt. Elizabeth, 50 kgs. 27

Sulphur Flowers—
Adelaide, 12 t. 10 c. £116
Cape Town 26 16 281
Champion Bay, 2 t. 15

Sulphuric Acid—
Penang, 3 t. 10 c. £18
Aden, 7½ 10
Singapore, 2 10 24
Algoa Bay, 40 cs. 28

Soda Crystals—
Newcastle, 10 t. 7 c. £30

Saltpetre—
Santos, 1 t. 5 c. £27
B. Ayres, 4 85
Oporto, 3 15 78
Lisbon, 2 17 64
Adelaide, 1 5 27
Canterbury, 29 drms 104

Superphosphate—
Pt. Lyttleton, 100 t. £800
Riga, 32 3 c. 103
Reval, 335 14 1 039
Riga, 395 8 1,188
Bluff, Hr. 50 200
Canaria, 2 10

Sodium Acetate—
Melbourne, 2 cks. £17

Sodium Silicate—
Lyttleton, 5 t. 3 c. £28

Salammoniac—
Melbourne, 13 c. £24
Salonica, 1 t. 19 66
Odessa, 5 170
Constantinople, 2 12 91

Sheep Dip—
Fremantle, 1 t. £55
Natal, 1 7 c. 66
Cape Town, 3 4 151
Algoa Bay, 6 2 190
,, 30 cs. 84
Natal, 5 280
E. London, 50 133
Napier, 29 drs. 104
Pt. Elizabeth, 20 7 300

Sodium Nitrate—
Calcutta, 2 t. £19
Mackay, 12 10 c. 125

Sodium Hyposulphite—
Adelaide, 13 t. 11 c. £79

Tartaric Acid—
Wellington, 8 c. £50
Lyttelton, 10 70
Hamburg, 2 cks. 66

Tannic Acid—
Yokohama, 300 lbs. £36

LIVERPOOL.

Week ending July 19th.

Acetic Acid—
St. John's, 10 cs. £20
Piræus, 5 c. 2 q. 7
Vera Cruz, 1 t. 3 2 19

Alum—
Talcahuano, 1 t. 3 c. £6
Vera Cruz, 10 1 q. 6
Alexandria, 14 t. 14 75

Albumen—
Vera Cruz, 5 c. £22

Ammonium Carbonate—
Gijon, 3 c. 1 q. £5

Ammonia—
New York, 10 c. £16

Ammonium Sulphate—
New York, 75 t 4 c. £836
,, 51 9 1 q. 607
Valencia, 50 600

Ammonium Muriate—
B. Ayres, 5 t. 3 c. 2 q. £123
New York, 5 1 1 123

Borate of Lime—
Philadelphia, 10 c. £10

Bleaching Powder—
Calcutta, 175 cs.
Genoa, 282 cks.
Ghent, 27
Hamburg, 89
Havana, 19
New York, 202 100 brls. 55 tcs.
Philadelphia, 55
San Sebastian, 200
Gijon, 14
Ancona, 35 46 pks.
Boston, 380
Chicago, 40 bxs.
Hamburg, 187
Lisbon, 17 34
Madrid, 122
Melbourne, 34
Naples, 22
Odessa, 3
Oporto, 30
Rotterdam, 6
Vera Cruz, 21

Boracic Acid—
Montreal, 5 c 2 q. £10

Borax—
Santiago de Cuba, 8 c. 2 q. £13

Brimstone—
Trinidad, 1 t. 19 c. 1 q £12

Carbolic Solid—
Rouen, 1 t. £100
Rotterdam, 3 4 c. 387
New Orleans, 1 2 2 q. 30

Carbolic Acid—
New York, 3 t. 13 c. 3 q. £293
Rouen, 1 2 73
Bilbao, 1 78
New York, 3 2 17
Rouen, 1 2 73
Barcelona, 6 16 1 335
Calcutta, 10 11
New York, 2 16 3 39
,, 1 3 1 55

Caustic Potash—
New York, 3 t. 11 c. £70
Brisbane, 12 13

Calcium Chloride—
Sydney, 15 t. 5 c. £30

Copperas—
Beyrout, 4 t. 3 c. 2 q. £10
Calcutta, 20 18 3 48
Alexandria, 11 10 25
Rio de Janeiro, 2 t. 4 c. 5
Rosario, 14 15

Copper Sulphate—
Havre, 2 t 2 c. 3 q £95
Rouen, 5 17 152
Bordeaux, 9 14 426
Ghent, 2 12 1 61
St. John's, 2 19 3 70
Santander, 9 19 2 208
Salonica, 1 2 3 23
Nantes, 62 8 1,502
Rotterdam, 1 2 21
Rouen, 2 15 68
Adelaide, 10 200
Barcelona, 3 19 86
Bordeaux, 19 15 2 395
Gijon, 5 6
Madras, 1 21
Vigo, 5 5
Bordeaux, 20 3 430
,, 19 19 3 430
Antwerp, 2 3 1 43
Oporto, 14 1 14
Pasages, 6 3 1 130
Rotterdam, 18 1 16
Barcelona, 9 19 2 199
Hamburg, 5 1 2 99
Leghorn, 5 2 1 110

Copper Sulphate—*continued.*
Nantes, 10 5 3 205
Genoa, 12 7 3 240

Caustic Soda—
Algoa Bay, 15 bxs.
Amsterdam, 2 brls.
Antwerp, 6 dms.
Bahia, 5
Barcelona, 100 cks.
Batoum, 200
Boston, 350
Brisbane, 20 bxs.
Calcutta, 106
E. London, 20 cs.
Fairwater, 56
Genoa, 68
Hamburg, 15
Ibrail, 16
Lisbon, 4
Malaga, 120
Malta, 15
Melbourne, 5 pks.
Monte Video, 50
New York, 350 50 brls.
Pernambuco, 80
Philadelphia, 150
Rio Grande do Sul, 50
St. John's, 6 pks
St. Louis, 25
Ambriz, 100 cks
Antwerp, 82
Bahia, 15
Bilbao, 164
Boston, 590
Calcutta, 178
Carril, 22 pks.
Chicago, 25
Constantinople, 33
Fairwater, 50
Genoa, 103
Iquique, 50 kgs.
Leghorn, 45
Lisbon, 60
Malaga, 64
Marseilles, 15
Monte Video, 150
Montreal, 60
Nantes, 18
Naples, 50
Oporto, 60
Pernambuco, 5
San Sebastian, 20 cks.
Sydney, 49
Tarragona, 40
Valencia, 160 95
Venice, 45
Yokohama, 50
Philadelphia, 135 brls. 208 dms.
Rangoon, 50
Rotterdam, 45
St. Petersburg, 155
Samarang, 195
Santander, 30
Savanilla, 30
Sevillle, 1
Vigo, 6
Yokohama, 50

Chemicals *(otherwise undescribed)*
Genoa, 10 c. £7
Vera Cruz, 4 2 q. 9
Sydney, 5 8

Dried Blood—
Rouen, 35 t. £245

Disinfectants—
Bombay, 1 t. 5 c. £12

Epsom Salts—
Bombay, 300 kgs. 4 cks.
Manilla, 10 cks.
Puerto Cabello, 5 cs.
Santiago de Cuba, 10
Coquimbo, 100 brls.
Rio de Janeiro, 50 kgs.

Gypsum—
Boston, 12 t. 10 c. £37

Guano—
Barcelona, 15 t. 5 c. 1 q. £158

Glycerine—
Santander, 3 c. £11
Halifax, 1 cs. 7
3 11

Lead Acetate—
Vera Cruz, 10 c. 2 q. £15

Lead Nitrate—
Vera Cruz, 5 c. 2 q. £6

Magnesium Calcide—
Constantinople, 21 lbs. £25

Manure—
Rouen, 67 t. 3 c. £728
Gr. Canary, 72 2 2 q. 646
Phosphate Rock
Hamburg, 15 t. £45

Magnesia—
Rio de Janeiro, 5 cs.
Hamburg, 8
Havre, 10
Valparaiso, 10

Magnesium Chloride—
New York, 6 t. 10 £17
Oxalic Acid—
Antwerp, 2 t. 6 c. 1 q. £68
Potassium Carbonate—
New York, 3 t. 15 c. £52
St. Louis, 4 19 74
Boston, 9 3 123
B. Ayres, 1 3 2 q. 24
Pitch—
Loanda, 20 brls.
New York, 13 t. 19 c.
Potassium Prussiate—
Alexandria, 1 c. £5
Potassium Chlorate—
Rio de Janeiro, 1 t. 5 c. £64
Shanghai, 1 10 89
Hamburg, 2 84
Hiogo, 5 233
Boston, 5 223
Sydney, 5 221
Barcelona, 4 163
Gijon, 2 5
Gothenburg, 5 217
Santos, 1 44
Phosphorus—
Shanghai, 4 c. 2 q. £35
Potashes—
Monte Video, 1 t. 6 c. 3 q. £45
Catania, 7 13 192
Phosphate—
Hamburg, 28 t. 9 c. £140
Sodium Bichromate—
Leghorn, 2 t. 3 c. £56
Genoa, 14 369
Soda Ash—
Adelaide, 37 brls.
Bahia, 10
Baltimore, 103 tcs. 68 cks.
Barcelona, 135 brls.
Boston, 338 tcs. 500 bgs. 227 cks.
B. Ayres, 400
Constantinople, 20 brls.
New York, 201 380
Pelotas, 30
Philadelphia, 223
Porto Alegre, 50
Rio de Janeiro, 145
Salonica, 25
Santander, 21
Santos, 10
Syra, 25
Volo, 20
We lington, 20
Bari, 9 cks.
Batoum, 35
Boston, 74 29 tcs.
Brisbane, 2
Carthagena, 35
Leghorn, 4
Maceio, 15
Monte Video, 20
Montreal, 14
Naples, 6
Odessa, 50
Oporto, 27
Rio de Janeiro, 40
Salt—
Akranes, 75 t.
Boston, 100
Calcutta, 292
Cameroons, 36
Demerara, 52
Milwaukee, 65
Montreal, 1,000
Newcastle, 83
New York, 40
,, 25
Old Calabar, 47 16 c.
Para, 53 11
Rio de Janeiro, 2 13
Rotterdam, 282
Santos, 1 12
Sioux City, 150
Trinidad, 26 2
Bakana, 20
Benin, 11 3
Boston, 100
Christiania, 400
Freemantle, 100
Ghent, 100
Hamburg, 50
Iceland, 300
Kingston, 5
Newcastle, 25
Para, 71 10
Shediac, 199 10
Trangesund, 422
Sodium Silicate—
Barranquilla, 5 cks.
Brail, 16
Para, 12
Brisbane, 4 cks.

Sodium Bicarbonate—
Adelaide, 50 cks.
Antwerp, 19
Barcelona, 525 kgs.
Boston, 112
Cartagena, 90
Christchurch, 20
Constantinople, 20 brls.
Dunedin, 180
Gothenburg, 15
Hamburg, 20
Konigsberg, 40
Malaga, 1 ck.
Montreal, 350
Newcastle, 40
New Orleans, 20
New York, 200
Rosario, 8 cs.
St. Petersburg, 100
Seville, 365
Stettin, 15
Sydney, 30
Syra, 20
Valencia, 20
Wellington, 20
Copenhagen, 12 100
Soda Crystals—
Malta, 50 brls.
St. Johns, Nfld. 50
Santander, 19
Sourabaya, 65
Sodium Tartrate—
Vera Cruz, 4 c. £17
Sodium Biborate—
Antwerp, 20 t. 4 c. 3 q. £622
Saltpetre—
Gijon, 15 c. £16
Saltcake—
Baltimore, 201 t. 8 c. 465
,, 74 19 178
Sodium Nitrate—
Genoa, 6 c. £7
Almeria, 2 t. 10 21
Malaga, 3 3 27
Naples, 3 4 3 q. 28
Sheep Dip—
Algoa Bay, 4 t. £137
,, 5 175
Superphosphate—
Libau, 699 t. 19 c. 3 q. £2,880
Sodium Bisulphite—
Calcutta, 5 t. 18 c. 1 q. £32
Salammoniac—
Karassunde, 15 c. £27
Alexandria, 1 t. 35
Kurrachee, 1 12 52
Smyrna, 1 34
New York, 4 19 1 q. 164
Sodium Chlorate—
New York, 2 t. 10 c. £131
Hamburg, 2 6
Boston, 15 41
Sulphuric Acid—
New York, 1 t. 3 c. £70
Sulphur—
Montreal, 17 t. 19 c. 3 q. £85
New York, 50 2 225
Pernambuco, 1 6
New York, 42 139
Trinidad, 1 19 1 13
Tartar—
St. Johns, Nf. 10 c. 2 q £52
Tar—
Manilla, 250 drms.
San Fernando, 1 brl.
Honolulu, 10 brls.
Loanda, 25
Zinc Muriate—
Bombay, 5 t. 13 £87
,, 1 9 20

GLASGOW.

Week ending July 24th.

Ammonium Sulphate—
St. Nazaire, 72 t. £728
Bleaching Powder—
Melbourne, 121 c. £25
Calcutta, 245¼ 86
Chemicals *(otherwise undescribed)*
Melbourne, £32
Dyestuffs—
Logwood
Boston, 40 c. £25
Melbourne, 215 115
Potassium Bichromate—
Gothenburg, 102 c. £147
Amsterdam, 12 cks.
Rotterdam, 10
Pitch—
St. Nazaire, 837 t. £1,130

Sulphuric Acid—
Madras, 6 t. 13¼ c. £47
Verdigris—
Melbourne, 5 c. £27. 16s.

HULL.

Week ending July 22nd.

Bone Size—
Amsterdam, 6 cks.
Bremen, 10
Ghent, 4
Harlingen, 3
Barytes—
Stettin, 100 t.
Bleaching Powder—
Stettin, 157 cks.
Caustic Soda—
Libau, 36 drums.
Copper Sulphate—
St. Petersburg, 21 cks.
Chemicals *(otherwise undescribed)*
Antwerp, 3 cks.
Amsterdam, 101
Abo, 3
Boston, 50
Bremen, 21
Christiania, 26 10 cs.
Gothenburg, 20 5
Hamburg, 10 188 36 pks.
Lisbon, 48 3
Libau, 65 300
St. Petersburg, 64
Rotterdam, 1 2
Sydney, 2
Stockholm, 1
Stettin, 30 13
Dyestuffs *(otherwise undescribed)*
Antwerp, 1 ck.
Hamburg, 1 1 cs. 3 drums
Rotterdam, 6 8
Manure—
Dunkirk, 247 bgs.
Hamburg, 91 t.
New York, 52
Reval, 100
Naphtha—
Dunkirk, 12 cks.
Pitch—
Antwerp, 130 t.
Superphosphate—
Aarhuus, 5,091 bgs.
Tar—
Amsterdam, 2 cks.
Hamburg, 16

TYNE.

Week ending July 23rd.

Antimony—
Abo, 5 c.
Antwerp, 1 t.
Copenhagen, 12 c.
Alkali—
Genoa, 8 t. 3 c.
Abo, 5 7
Gothenburg, 8 9
Odense, 7 6
Christiania, 1 4
Arsenic—
Barcelona, 1 t. 18 c.
Barytes Carbonate—
Honfleur, 95 t. 2 c.
Copenhagen 5
Bleaching Powder—
Narva, 25 t.
Bilbao, 11 5 c.
Genoa, 20 6
Naples, 10 5
Helsingfors, 40 1
Flensborg, 3 8
Hamburg, 13 6
Barcelona, 1
Gothenburg, 5 12
Hamburg, 12 10
Bilbao, 21 15
Riga, 34 18
Christiania, 4 16
,, 25 1
Malmo, 12 19
Oporto, 10 4
Lisbon, 22 4
Libau, 30 3
Rotterdam, 8 19
,, 21 13
,, 2 4
,, 7 16
Barytes Sulphate—
Genoa, 9 t. 16 c.
Borax—
Helsingfors, 3 t.

Caustic Soda—
Abo, 6 t.
Helsingfors, 4 18 c.
Antwerp, 10
Barcelona, 30
Riga, 21 9
Copenhagen, 4 13
Litharge—
Abo, 5 c.
Hamburg, 1 t. 1
Gothenburg, 16
Antwerp, 8
Riga, 12
Rotterdam, 2 cks.
,, 12
Magnesia—
Hamburg, 3 c.
Odense, 1
Libau, 4
Potassium Chlorate—
Rotterdam, 1 t.
Pitch—
Bilbao, 1 t. 6 c.
Potassium Bichromate—
Abo, 15 c.
Phosphorus—
Barcelona, 1 t. 4 c.
Sulphur—
Gothenburg, 10 t.
Salt—
Vardo, 100 t.
Esbjerg, 2 10 c.
Soda Ash—
Narva, 54 t. 19 c.
Naples, 2 8
Abo, 28
Helsingfors, 28 4
Hamburg, 14 19
Barcelona, 20 11
Aalborg, 3 6
Libau, 10 15
Soda—
Genoa, 1 t. 18 c.
Ancona, 6 9
Abo, 3 4
Helsingfors, 11 5
Gothenburg, 4 19
Nakskov, 3 7
Horsens, 14 8
Christiania, 6
Rotterdam, 25 4
Aarhuus, 3 9
Sodium Chlorate—
Hamburg, 1 t. 2 c.
Sodium Nitrate—
Abo, 2 t.
Superphosphate—
Riga, 200 t. 4 c.
Sodium Silicate—
Rotterdam, 3 t. 3 c.
Sodium Monohydrate—
Lisbon, 3 c.
Tar—
Malmo, 6 t.

GRIMSBY.

Week ending July 19th.

Chemicals *(otherwise undescribed)*
Antwerp, 2 cks. 343 pks.
Rotterdam, 9 cs.

GOOLE.

Week ending July 16th.

Benzole—
Antwerp, 26 cks.
Bleaching Preparations—
Antwerp, 72 cks.
Rotterdam, 28
Rouen, 28
Bleaching Powder—
Dunkirk, 15 cks.
Coal Products—
Dunkirk, 25 cks.
Rotterdam, 25
Chemicals *(otherwise undescribed)*
Ghent, 20 cks.
Hamburg, 42
Rotterdam, 20
Dyestuffs *(otherwise undescribed)*
Boulogne, 2 cks. 6 cs. 5 drms.
Ghent, 2 2
Rotterdam, 2
Rouen, 1
Manure—
Boulogne, 169 bgs.
Dunkirk, 154
Pitch—
Antwerp, 100 t.

PRICES CURRENT.

WEDNESDAY, July 30, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,		64/-	
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3¾
Picric .. .. ,,	0	1	1
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2½
Arsenic, white powdered .. .. per ton	13	10	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	10	0
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	10	0
,, ,, (grey), Hull .. .. ,,	11	10	0
Aniline Oil (pure) .. .. per lb.	0	0	10¾
Aniline Salt ,, ... ,,	0	0	9½
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	10	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	13	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	2	6
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. per gallon	0	4	0
,, 50/90 ,, ... ,,	0	3	0
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7¾
,, (crude 60°) .. .. per gallon	0	2	1
Creosote (ordinary) .. .. ,,	0	0	2
,, (filtered for Lucigen light) .. .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	5	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	57	10	0
,, Sulphate .. .. ,,	19	0	0
,, Oxide (copper scales) .. .. ,,	52	10	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	22	0	0
Lime, Acetate (brown) .. .. ,,	7	5	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	1½
Oils:—			
Cotton-seed .. .. per ton	21	15	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton.	19	10	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	22	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	21	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	20	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	2¾
,, Nitrate .. .. ,,	0	2	8
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	2	6
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	5	0
,, ,, (Soda Crystals) .. .. ,,	2	15	0
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	10	17	6
,, ,, (74 % Caustic Soda) ,, .. ,,	10	10	0
,, ,, (70 % Caustic Soda) ,, .. ,,	9	17	6
,, ,, (60 % Caustic Soda, white) .. ,,	9	0	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	8	15	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	3
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8
,, Barium, 95 % .. .. ,	0	0	5½
,, Potassium .. .. ,,	0	0	8¾
Sulphur (Flowers) .. .. per ton.	8	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	98	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	0	0

THE

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LATE ADVERTISEMENT.

FOR SALE.—Carter's No. 2 Disintegrator, in perfect order, equal to new, only used for soap powder. Also useful Elevators, &c., from a manure works.—FULLER, Junr., Old Bank Chambers, Wolverhampton. [168

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As it is one of the special features of the *Chemical Trade Journal* to give the earliest information respecting new processes, improvements, inventions, etc., bearing upon the Chemical and allied industries, or which may be of interest to our readers, the Editor invites particulars of such—when in working order—from the originators; and if the subject is deemed of sufficient importance, an expert will visit and report upon the same in the columns of the *Journal*. There is no fee required for visits of this kind.

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THE END OF SMOKE.

OUR readers. perhaps, will be delighted to hear that smoke is to be mended and ended, that our great manufacturing industries are to be conducted in the future with no more noxious emanation than a little luminiferous ether, that our factory chimneys are to be carefully taken down and used for grottos and garden walls, and we are to become even as the children of sweetness and light. We think we have heard something of this before.

The smoke problem is said to be solved. Mr. Elliott, of Newbury, has been describing an improved machine whereby all the smoke from boiler furnaces can be washed white, and the gases emitted at a much lower level than heretofore without producing any nuisance. It appears that this gentleman has become somewhat tired of being fined some four times a day for emitting black smoke, and has exercised his ingenuity in such a manner as to deprive the local authorities of some important part of their revenue. We have noticed in several newspapers an account of the machine which is supposed to annihilate all the evils under which we are at present suffering. But the world is large, and inventors are too apt to neglect the labours of those who have gone before them. Manchester people will recollect that about the year 1879 much ado was made of a machine for effecting the foregoing purpose. We now allude to Johnson's Smoke and Fume Washer, as arranged by Mr. Benjamin Goodfellow, of Hyde. There was erected a very simple machine for washing smoke. It was an adaptation of the well-known "Porion Evaporator," which we, on several occasions previous to this, had recommended to manufacturers as a means whereby the carbon and a great portion of the sulphurous acid could be washed out of coal smoke. In the same year, Wilson and French's "Fume Condenser" was working at Sheffield, and the writer, in conjunction with the late Dr. Angus Smith, went to inspect both of these machines. Where are they now? Have they been consigned to the limbo of forgotten things, and do they only exist in spirit in the 16th annual report of the Alkali Act Inspector?—It is useless to say Mr. Elliott's machine has anything new except perhaps in so far as he proposes to use mechanical power to draw the gases into his washing machine, when they would go there without being drawn at all. Such an appliance as Mr. Elliott's may possibly be useful in connection with boilers heated by sawdust and shavings, which, we understand, are employed by him in his works, but there are many things in connection with the combustion of coal which seem to have been forgotten, though they will probably be found out during a lengthened trial of the machine when put up for treating coal smoke. We notice from the report of Professor Heaton that the water from the washer is browned from tarry matter and faintly acid. This has been the weak point in all smoke washers. Sulphurous acid becomes converted into sulphuric acid, and eats away shafting and fanners and paddles, and everything, in fact, which comes in contact with it. We have had much experience with these machines, and as we reported

to a firm of manufacturers in 1878, there is no better smoke-washer extant than the Porion Evaporator. While the Royal Commission was sitting upon the revision of the Alkali Acts, many experiments were made with a view to bring smoke-washing to a practical issue if it were possible, but the only outcome was, that the process would not pay, but involved an expenditure for which there was no possibility of any return. It is true that Mr. Estcourt, the city analyst, of Manchester, who made many experiments with the washer at Messrs. Goodfellows' Works, endeavoured to produce a crude sulphite of lime, for which, in his opinion, many uses could be found, but we believe he was not successful in introducing the material into the market, and, like all other smoke-washing schemes, the process was abandoned. Since then, however, a great demand has sprung up for sulphites. Sulphite of lime, in the form of bi-sulphite is largely employed in paper works for the manufacture of pulp from wood, and it is more than probable that something might be done now in the way of smoke-washing, rendering at the same time the sulphite of lime, formed during the operation, available for commerce. We have many times in these pages endeavoured to prove to our readers that the carbon in the black smoke is not the injurious ingredient. Residents in the vicinity of Higher Broughton, a district over which most of the Manchester smoke is continually blowing, have noticed that in recent years the shrubs and trees and household effects are not coated with carbon in the way they formerly were. But there has been no diminution in the evils resulting from the invisible sulphurous acid accompanying the smoke. It is now more difficult to grow flowers and trees in the neighbourhood of large towns, than it was before, and yet there has been smoke suppression, vigilantly conducted, for a long period. Until the authorities, smoke-washers, manufacturers, and sanitators generally, appreciate that it is the sulphurous acid that has to be dealt with, we have no hope that our chimneys will be pulled down for grotto building, or that they will be permanently superfluous.

THE McKINLEY BILL.

(Concluded from page 63.)

GLASS AND GLASSWARE.—

107. Green, and coloured, and flint, and lime glass bottles, holding more than one quart, and demijohns, and carboys (covered or uncovered), and other plain, moulded, or pressed green, and coloured, and flint, and lime glassware, not specially provided for in this act, one cent per pound; if holding one pint, and not more than one quart, one and one-quarter cents per pound; if holding less than one pint, and not less than one-quarter of a pint, one and one-half cents per pound; if holding less than one-quarter of a pint, fifty cents per gross.

108. All articles enumerated in the preceding paragraph, if filled, and not otherwise provided for in this act, and the contents are subject to an ad valorem rate of duty, or to a rate of duty based upon the value, the value of such bottles, vials, or other vessels shall be added to the value of the contents for the ascertainment of the dutiable value of the latter; but if filled, and not otherwise provided for in this act, and the contents are not subject to an ad valorem rate of duty, or to rate of duty based on the value, or are free of duty, such bottles, vials, or other vessels shall pay, in addition to the duty, if any, on their contents, the rates of duty prescribed in the preceding paragraph: *Provided*, That no article manufactured from glass described in the preceding paragraph shall pay a less rate of duty than forty per centum ad valorem.

111. Chemical glassware for use in laboratory, and not otherwise provided for in this act, forty-five per centum ad valorem.

112. Thin-blown glass, blown with or without a mould, and all other manufactures of glass, or of which glass shall be the component material of chief value, not specially provided for in this act, ten cents per dozen and forty per centum ad valorem.

113. Heavy-blown glass, blown with or without a mould, not cut or decorated, finished or unfinished, five cents per pound and forty per centum ad valorem.

SCHEDULE C.—METALS AND MANUFACTURES OF IRON AND STEEL.

136. Chromate of iron, or chromic ore, fifteen per centum ad valorem.

137. Iron ore, including manganiferous iron ore, also the dross or residuum from burnt pyrites, seventy-five cents per ton. Sulphur ore, as pyrites, or sulphuret of iron in its natural state, containing not more than three and one-half per centum of copper, seventy-five cents per ton: *Provided*, That ore containing more than two per centum of copper, shall pay, in addition thereto, one and one-fourth cents per pound for the copper contained therein: *Provided, also*, That sulphur ore as pyrites or sulphuret of iron in its natural state, containing in excess of twenty-five per centum of sulphur, shall be free of duty, except on the copper contained therein, as above provided: *And provided further*, That in levying and collecting the duty on iron ore no deduction shall be made from the weight of the ore on account of moisture which may be chemically or physically combined therewith.

138. Iron in pigs, iron kentledge, spiegeleisen, ferro-manganese, ferro-silicon, wrought and cast scrap iron, and scrap steel, three-tenths of one cent per pound; but nothing shall be deemed scrap iron or scrap steel except waste or refuse iron or steel fit only to be remanufactured by resmelting or rerolling.

175. Iron or steel sheets, plates, wares, or articles, enamelled or glazed with vitreous glasses, forty-five per centum *ad valorem*.

191. Antimony, as regulus or metal, three-fourths of one cent per pound.

195. Copper imported in the form of ores, one and one fourth cents per pound on each pound of fine copper contained therein.

198. Copper in plates, bars, ingots, Chili or other pigs, and in other forms, not manufactured, not specially provided for in this act, two cents per pound.

203. Lead ore and lead dross, one and one-half cents per pound: *Provided*, That silver ore and all other ores containing lead shall pay a duty of one and one-half cents per pound on the lead contained therein, according to sample and assay at the port of entry.

204. Lead in pigs and bars, molten and old refuse lead run into blocks and bars, and old scrap-lead fit only to be re-manufactured, two cents per pound.

205. Lead in sheets, pipes, shot, glaziers' lead, and lead wire, two and one-half cents per pound.

206. Metallic mineral substances in a crude state and metals unwrought, not specially provided for in this act, twenty per centum ad valorem; mica, thirty-five per centum ad valorem.

NICKEL.—

207. Nickel in matte, or other crude form not ready for consumption in the arts, three cents per pound on the nickel contained therein.

208. Nickel, nickel oxide, alloy of any kind in which nickel is the component material of chief value, fifteen cents per pound.

FREE LIST.

SEC. 2. The following articles when imported shall be exempt from duty:

476. Acids used for medicinal, chemical, or manufacturing purposes, not specially provided for in this act.
477. Aconite.
478. Acorns, raw, dried, or undried, but unground.
479. Agates, unmanufactured.
480. Albumen.
481. Alizarine, natural or artificial.
482. Amber, unmanufactured, or crude gum.
483. Ambergris.
484. Aniline salts.
487. Annatto, roucou, rocoa, or orleans, and all extracts of.
488. Antimony ore, crude sulphide of.
489. Apatite.
490. Argal, or argol, or crude tartar.
491. Arrow-root raw or unmanufactured.
492. Arsenic and sulphide of, or orpiment.
493. Arseniate of aniline.
494. Articles in a crude state used in dyeing or tanning not specially provided for in this act.
495. Articles the growth, produce, and manufacture of the United States, when returned after having been exported, without having been advanced in value or improved in condition by any process of manufacture or other means; casks, barrels, carboys, bags, and other

vessels of American manufacture exported filled with American products, or exported empty and returned filled with foreign products, including shooks when returned as barrels or boxes; also quicksilver flasks or bottles, of either domestic or foreign manufacture, which shall have been actually exported from the United States; but proof of the identity of such articles shall be made, under general regulations to be prescribed by the Secretary of the Treasury; and if any such articles are subject to internal tax at the time of exportation such tax shall be proved to have been paid before exportation and not refunded: *Provided*. That this paragraph shall not apply to any article upon which an allowance of drawback has been made, the re-importation of which is hereby prohibited except upon payment of duties equal to the drawbacks allowed; or to any article manufactured in bonded-warehouse and exported under any provision of law: *And provided further*, That when manufactured tobacco which has been exported without payment of internal-revenue tax shall be re-imported it shall be retained in the custody of the collector of customs until internal-revenue stamps in payment of the legal duties shall be placed thereon.

496. Asbestos, unmanufactured.
497. Ashes, wood and lye of, and beet-root ashes.
498. Asphaltum and bitumen, crude.
499. Asafetida.
500. Balm of Gilead.
501. Barks, cinchona or other from which quinine may be extracted.
502. Baryta, carbonite or witherite.
503. Bauxite or beauxite.
504. Beeswax.
508. Bismuth.
509. Bladders, including fish-bladders or fish-sounds, crude, and all integuments of animals not specially provided for in this act.
510. Blood, dried.
513. Bones, crude, or not burned, calcined, ground, steamed, or otherwise manufactured, and bone-dust or animal carbon, and bone ash, fit only for fertilizing purposes.
519. Brazil paste.
524. Bromine.
526. Burgundy pitch.
528. Cadmium.
529. Calamine.
530. Camphor, crude.
531. Castor or castoreum.
533. Cerium.
534. Chalk, unmanufactured.
535. Charcoal.
538. Coal, anthracite.
540. Coal-tar, crude.
541. Cobalt and cobalt-ore.
542. Cocculus indicus.
543. Cochineal.
552. Cryolite, or kryolith.
553. Cudbear.
556. Cutch.
557. Cuttle-fish bone.
560. Divi-divi.
561. Dragon's blood.
562. Drugs, such as barks, beans, berries, balsams, buds, bulbs, and bulbous roots, excrescences such as nut-galls, fruits, flowers, dried fibres, and dried insects, grains, gums, and gum-resin, herbs, leaves, lichens, mosses, nuts, roots, and stems, spices, vegetables, seeds aromatic, and seeds of morbid growth, weeds, and woods used expressly for dyeing; any of the foregoing which are not edible and are in a crude state, and not advanced in value or condition by refining or grinding, or by other process of manufacture, and not specially provided for in this act.
564. Emery ore.
567. Farina.
570. Feldspar.
572. Fibrin, in all forms.
601. Grease, degras, and oils, such as are commonly used in soap-making or in wire-drawing, or for stuffing or dressing leather, and as are fit only for such uses, not specially provided for in this act.
602. Guano, manures, and all substances expressly used for manure.
605. Gutta percha, crude.
606. Gypsum, or sulphate of lime.
614. Horns and parts of, unmanufactured, including horn strips and tips.
616. India rubber, crude, and milk of, and old scrap or refuse India rubber which has been worn out by use and is fit only for re-manufacture.
617. Indigo.
618. Iodine, crude.
619. Ipecac.
620. Iridium.
622. Jalap.
626. Kelp.
627. Kieserite.
628. Kyanite, or cyanite, and kainite.
629. Lac-dye, crude, seed, button, stick, and shell.
630. Lac spirits.
631. Lactarine.
635. Licorice-root, unground.
637. Lime, citrate of.
638. Lime, chloride of, or bleaching-powder.
640. Litmus, prepared or not prepared.
642. Madder and munjeet, or Indian madder, ground or prepared, and all extracts of.
643. Magnesite, or native mineral carbonate of magnesia.
644. Magnesium.
646. Manganese, oxide and ore of.
658. Myrobolan.
660. Newspapers and periodicals; but the term "periodicals" as herein used shall be understood to embrace only un-bound or paper-covered publications, containing current literature of the day and issued regularly at stated periods, as weekly, monthly, or quarterly.
661. Nux vomica.
663. Oil cake.
664. OILS: Almond, amber, crude and rectified ambergris, anise or anise-seed, aniline, aspic or spike lavender, bergamot, cajeput, caraway, cassia, cinnamon, cedrat, chamomile, citronella or lemon grass, civet, fennel, jasmine or jasimine, juglandium, juniper, lavender, lemon, limes, mace, neroli or orange flower, nut oil or oils of nuts not otherwise specially provided for in this act, orange oil, olive oil for manufacturing or mechanical purposes unfit for eating and not otherwise provided for in this act, ottar of roses, palm and cocoanut, rosemary or anthoss, sesame or sesamum-seed or bean, thyme, origanum red or white, valerian, spermaceti, whale, and other fish oils of American fisheries, and all other articles the produce of such fisheries.
666. Opium, crude or unmanufactured, and not adulterated, containing nine per centum and over of morphia.
668. Orchil, or orchil liquid.
669. Ores, of gold, silver, and nickel: *Provided*, That ores of nickel, containing more than two per centum of copper, shall pay a duty of one and one-fourth cents per pound on the copper contained therein.
670. Osmium.
671. Palladium.
672. Paper stock, crude, of every description, including all grasses, fibres, rags (other than wool), waste, shavings, clippings, old paper, rope ends, waste rope, waste bagging, old or refuse gunny bags or gunny cloth, and poplar or other woods, fit only to be converted into paper.
673. Paraffine.
678. Philosophical and scientific apparatus, instruments and preparations.
679. Phosphates, crude or native.
681. Platina, in ingots, bars, sheets, and wire.
682. Platinum, unmanufactured, and vases, retorts, and other apparatus, vessels, and parts thereof composed of platinum, for chemical uses.
683. Plumbago.
685. POTASH.—Crude, or "black salts," chlorate of potash, muriate of potash, nitrate of potash, or saltpetre, crude, sulphate of potash, crude.
686. Professional books, implements, instruments, and tools of trade, occupation, or employment, in the actual possession at the time of persons arriving in the United States; but this exemption shall not be construed to include machinery or other articles imported for use in any manufacturing establishment, or for any other person or persons, or for sale.
687. Pulu.
688. Pumice.
690. Quinia, sulphate of, and all alkaloids or salts of cinchona-bark.
695. Saffron and safflower, and extract of, and saffron cake.
697. Salacine.
710. Soda, nitrate of, or cubic nitrate, and chlorate of.
711. Sodium.
725. Storax, or styrax.
726. Strontia, oxide of, and protoxide of strontian, and strontianite, or mineral carbonate of strontia.
728. Sulphur, lac or precipitated, and sulphur or brimstone, crude, in bulk, sulphur ore, as pyrites, or sulphuret of iron in its natural state, containing in excess of twenty-five per centum of sulphur (except on the copper contained therein).
732. Tar and pitch of wood.
737. Tin ore, and tin in bars, blocks, pigs, or grain or granulated.
741. Tripoli.
742. Turmeric.
743. Turpentine, Venice.

744. Turpentine, spirits of.
747. Uranium, oxide and salts of.
749. Valonia.
750. Verdigris, or subacetate of copper.
752. Wax, vegetable or mineral.

ON SOME DIFFERENT KINDS OF GAS FURNACES.

By Mr. BERNARD DAWSON.

(A paper set down for reading before the Institution of Mechanical Engineers at Sheffield.)

(Concluded from page 64.)

THE regulation of the pull or draught of the chimney on the furnace —so as to draw in just sufficient cold air for burning the gas, without drawing unburnt gas into the chimney—although often neglected by the furnace-men, can easily be effected with a little care, provided that the respective sectional areas of the gas and air inlets and of the outlet to the chimney have been duly considered in the building of the furnace.

There are many boilers, both Lancashire and Cornish, with provision for heating the air before its admission to the boiler furnaces; and at the works of Messrs. Nettlefolds at Tydu near Newport, Monmouthshire, this is said to have proved to be well worth the trifling extra expense and complication in the boiler seating and flues.

The failures of many small applications of gas with cold air to such furnaces as annealers for glass bottles, foundry stoves, annealers for light castings, &c., has no doubt been often due to the neglect to keep the doors of such furnaces tightly closed; the result has been lack of chimney draught to draw air in *at the right place* for combustion with the gas. Many such furnaces properly attended to are giving entire satisfaction in regular work.

It scarcely comes within the scope of this paper to review all those that may be called semi-gas furnaces, in which the combustion or at least the ignition of the gas takes place partly in the grate or producer as well as in the furnace itself. The names of many such furnaces are too well known to need mention here, and most of them have been fully described elsewhere; and as they come under the head of gas producers quite as much as under that of gas furnaces, they are omitted from the present paper.

Reversing Regenerators.—The principles and construction of furnaces with reversing regenerators for both gas and air are now much better and more generally understood than was the case only a few years ago. It is curious, however, to what a small extent gas crucible furnaces have been substituted for the old furnaces or "coke holes" in which the greater part of the crucible steel melted in Sheffield is still made. When it is considered that, according to the size of furnace and other details, a ton of crucible steel may be made with from 33 to 40 cwts. of small coal in a gas furnace, against from 52 to 60 cwts. of coke in a "coke hole," it might be thought that more success would have attended the efforts on the part of the Sheffield steel makers to overcome the trade prejudices existing against such innovations as melting steel in crucibles with gas. The many objections heard from time to time, as to inability to keep a mellow heat or to regulate the heat and the draught, are such as can certainly be overcome; there may, however, be other objections and difficulties, with which only those actually engaged in steel melting are acquainted.

With so many different means of attaining and regulating the temperature in gas furnaces, and with such perfect control over the admission of gas and air and over the chimney draught, there are few industrial processes requiring heat to which producer gas ought not to be capable of being advantageously applied. The question of extra first cost in the erection of new furnaces, and the impossibility of applying gas to existing coal-fired furnaces with any degree of success, have very much prevented the extension of gas firing: although the erroneous ideas prevalent as to the necessarily complicated nature of gas furnaces, and as to the cost in repairs and maintenance, have probably done quite as much to prevent many such furnaces from being built.

Reversing Valves.—The best arrangement of valves for reversing regenerative furnaces is a matter of some importance; for with leaky valves the waste of gas directly up the chimney from the main gas-flue is very great. For gas the use of the ordinary "butterfly" reversing valve is being superseded by that of "pot" or double-beat mushroom or pan valves, as being less likely to become warped through carelessness or neglect. For air-valves the butterfly valve is generally used. For small and medium sizes of heating furnaces, butterfly valves, if made sufficiently large, work well enough. A gas-valve too small for its work soon becomes overheated, warped, and leaky. The tendency in most regenerative furnaces for the greater part of the spent gases or waste heat to pass down through the gas-chamber to the chimney, in preference to passing down through the air-chamber, is one which leads to the trouble with the gas-reversing valve. This can be averted, however, by two or three means: by the chequer work being less closely stacked in the air-chamber; by attention to the shape and position of the passages and ports between the furnace and the air-chamber; and by the provision of dampers. In addition to the valves above mentioned, there are also the hydraulic slide-valves of Mr. Le Neve Foster; water-seated valves; and the revolving valves designed by Mr. John Ramsbottom, which, if carefully made and seated, are probably as simple and efficacious as any in use.

With regard to ingot and other reheating furnaces, an objection is raised that, whereas with a coal-fired furnace the furnace-men attend to the fire themselves, with a gas-fired furnace, they would not or could not attend also to the gas producer, which thus entails an extra man: or say three extra men for a group of producers supplying gas to a number of re-heating or mill furnaces. This question of extra labour has not unnaturally been brought forward in connection with various combinations of gas producers and furnaces, as showing the advantage of having the producer attached to its own furnace. The disadvantages of this plan appear to be that, whenever from any reason a furnace is stopped, the gas producer connected with it must stand too; representing so much idle capital, and therefore a greater total expenditure in gas producers than where, say, a dozen producers are erected all together to supply a number of furnaces of which only a certain proportion are ever at work at the same time. The necessity of having to convey fuel and ashes to and from several furnaces in large works is also a disadvantage in the plan of combined producer and furnace. The loss of heat by radiation, in the passage of the gas from the producers to the furnaces, is sometimes adduced as an argument in favour of the combined plan; but with properly constructed flues this is more imaginary than real. Even where there is any appreciable loss of heat, it is more often than not an advantage in saving wear and distortion of the valves; and, as has been often pointed out, there is frequently an absolute economy in fuel by using cooled gas; besides which, there are minor advantages, such as that the dust contained in gas made from some coals is deposited in these flues instead of in the furnaces themselves. Most of these combined furnaces depend for their economical working upon a steam boiler of some kind, to utilise the waste heat or gases which would otherwise pass unused to the chimney.

The new form of gas producer lately described by Messrs. Head and Pouff (Iron and Steel Institute Journal, 1889, II., page 256) does not possess this advantage, as there are regenerators into which a portion of the waste heat is conducted, another portion being introduced under the grate bars of the gas producer. So far as can be judged from its principle and from the figures and analyses given, the chemical reactions in this furnace appear to be theoretically correct. Time alone will show what is its cost of maintenance, and its capacity for continuous work.

The Gorman heat-restoring gas furnace is another of these combined furnaces and producers; but in this, a continuous regeneration is effected by passing air through a number of fire-clay tubes. These furnaces, the author understands, have been erected at the Clydesdale Iron Works, Glasgow, and at several shipyards in England and on the Continent.

The Radcliffe furnace, Fig. 24, which is in use for melting steel in the gun factory at Woolwich Arsenal, is another instance of the combined furnace and producer; and Mr. Radcliffe states that by its use he succeeded in effecting considerable saving in fuel over Price's retort furnaces, which this plan has superseded. In this furnace, steels of various degrees of hardness are produced, and the author is assured that it is giving complete satisfaction in all respects. In this furnace also, air is heated by transmission through fire-clay tubes.

The Boetius furnace, which is used in a few of the glass works in this country, may also be classed with combined furnaces. There are several varieties of this furnace; but such of them as the author has been fortunate enough to see, are fed with coke all round an annular space, whence the fuel slips down into an arrangement of grates with bars, over which are arches whereon the pots containing the glass are arranged. There is no reversing regeneration. A description of this, as well as of similar furnaces for zinc melting, and also of several forms of gas retorts, and of porcelain-burning, lime-burning, and other furnaces, was given by Mr. Ramdohr in pamphlets published in Leipzig in 1881.

Glass Furnaces.—Reversing regenerative furnaces are now largely used for melting glass, and there are several forms of glass furnaces.

1. Continuous tank furnaces, in which the process of melting the raw material goes on at the same time that the melted glass is being blown into bottles or into cylinders for sheet glass. In most of these furnaces, the sand, soda, &c., are fed into one end, while the gatherers or blowers are arranged round the other end.

2. Intermittent tank furnaces, in most of which the material is melted by night and blown during the day.

3. Pot or crucible furnaces.

These three processes of glass making are much akin to two of the steel melting processes carried on in what are known as open-hearth and pot or crucible furnaces.

In glass works, gas is also used for annealing bottle and plate glass; for the "glory holes," in which in some works the necks of the bottles are finished; and for other small accessory furnaces.

In tube works, furnaces with reversing regeneration are used for welding iron tubes for water gas and steam, although the use of gas furnaces has not at present extended beyond a few of the largest works.

In the manufacture of steel, the principle and uses of the open-hearth furnace are well understood. Of this furnace, as suited for the acid or hematite process, some modification has been found by experience to be advisable for working on the basic process. Acid furnaces are at work in this country, varying from 2 tons up to 40 tons capacity. The wisdom of building furnaces of over 20 or 25 tons capacity has been questioned. It is usually possible to obtain a greater number of casts of steel per week from the smaller furnaces, and where the total capacity of the works is divided among several smaller furnaces, instead of being concentrated in one or two very large ones, times of repairs involve less capital standing idle, fewer highly paid men thrown out of work, and less interruption in the supply of ingots to the mills. Into the vexed question of the relative consumption of fuel in large and small furnaces, it is not here intended to enter. Were there many works in which both large and small furnaces were employed, using gas from the same fuel and using exactly the same raw materials, the subject might prove profitable for discussion. The same is true of the conflicting testimony in favour both of coal-fired and of gas-fired furnaces of all sorts. Be it borne in mind, however, that there are both good and bad furnaces, and both good and bad furnace-men. There is also some diversity of opinion as to the propriety of using the open-hearth furnace for making the higher class of tool-steel and other special steels; it is this probably that has helped to check the extension of regenerative crucible or pot melting furnaces in place of the coke holes already alluded to. Whenever the use of water gas, made by the processes recently introduced, becomes adopted for melting steel in the open-hearth furnace, it will probably be used in furnaces provided with means for air regeneration only.

Open-hearth furnaces and regenerative crucible furnaces for melting brass and phosphor bronze, &c., have not, as far as the author is aware, been used to any great extent in this country or abroad. Many objections are raised by brassfounders to the use of gas furnaces for melting any forms of brass or metal which contain zinc or spelter. These, however, do not appear to be insurmountable, as there are some gas furnaces so used at the Horwich locomotive works of the Lancashire and Yorkshire Railway, which give no trouble in this respect.

The applications of jets of water gas for welding large tubes, boiler flues, seams of sugar pans, &c., carried out at Messrs. John Brown & Co.'s works in this town, and also at other places, can scarcely be accurately described as furnaces, and therefore admit of no more than passing mention.

The Ponsard revolving steel furnace, having continuous regeneration of air by means of a chamber filled with hollow bricks, is another form of furnace with producer attached.

Among other applications of producer gas upon the reversing or continuous regenerative principle are those devised some years ago by Mr. Dunnachie, and used in the production of the Glenboig brand of silica bricks, and at Bournemouth for burning glazed sanitary pipes, and in a modified form for Staffordshire blue bricks at Tamworth, and for pottery in North Staffordshire. In this case the gas producers do not form an integral part of the furnaces or kilns, but stand at any convenient distance away. In these kilns the products of combustion from one kiln are drawn by chimney draught through the next kiln in the series, and the "green" bricks are dried by this waste heat on its way to the chimney. The kiln which is being fired, that is, in which the gas is being burnt, is supplied with hot air drawn from the kiln last fired, the air thus heated having been used to cool the bricks in that kiln. A continuous cycle or series is thus maintained. The author believes that Mr. Lowood has for some years been working kilns upon this principle in the neighbourhood of Sheffield. Messrs. Siemens and others have also devised arrangements of regenerative gas kilns for brick and pottery burning.

The various arrangements of stoves and gas furnaces proposed by Mr. Bull for the manufacture of iron and steel direct from the ore, while highly ingenious, are at the same time complicated and intricate. Both at Seraing and at the experimental works at Trimsaran in South Wales, it is claimed that the expectations of the inventor have been realised.

The mention of Mr. Fletcher of Warrington calls to mind a large number of gas furnaces, principally on a small scale, and applicable to a great variety of purposes. As far as the author knows they have been confined to the use of ordinary illuminating or town gas. There are few industries requiring the intelligent use of purified gas which are not indebted to the patient investigations and experiments of Mr. Fletcher. It is, however, somewhat outside the range, even of a discursive paper like the present, to examine or illustrate these manifold applications to the minor industries of this country. Mr. Emerson Dowson's various applications of heating gas deserve recognition; and it is to be hoped that at some future date the various types of small gas furnaces, to which these truly belong, will be treated of.

In the face of the discrepancies in the statements of the highest authorities in the iron and steel and other allied industries, as to the comparative waste of iron and steel in gas furnaces as compared with coal-fired heating furnaces, the author will merely suggest that careful examination might very possibly lead to the detection of the cause of any waste on ingots re-heated by gas, say exceeding four per cent. waste, such as has been complained of by some users of these furnaces. The possibility of preventing oxidization or scale in tube-welding, annealing, and other similar furnaces by the use of gas may be taken to be fully established; and in the copper, brass, and other metal trades there is some evidence to show that discoloration of metal, such as brass wire, cartridge cases, &c., may be prevented even in furnaces which are open or only partially closed. Thus the heavy consumption of fuel for heating coal-fired muffles, or furnaces that are entirely heated internally by radiation or conduction through thin walls, may be considerably reduced. In some cases where experimental or trial furnaces have been built and supplied by gas from a single producer, their failure and abandonment have been caused by the varying of intermittent supply of gas. There are, however, producers of different forms which may be relied upon to supply gas of a uniform quantity and quality from a single producer. It is possible that undue stress has been laid upon the loss of heat when coal is used in a gaseous form, owing to radiation from the producer in which it is gasified. No doubt this does take place; but with well-designed furnaces this initial loss should be more than compensated for by the control over the supply of air admitted for combustion, by regeneration, and by the more perfect combustion of the fuel itself. Mr. Holley, in his presidential address to the American Institute of Mining Engineers, said that "regenerative furnaces will gradually, but inevitably, take the place of the ordinary heating, puddling, and melting furnaces, thus preventing the application of unspent furnace heat to steam generation." That was in 1875, and yet how much still remains to be done.

In the chemical industries such a variety of gas furnaces have been introduced that, without doing more than mentioning Mr. McTear's carbonating furnace, the Jones and Walsh salt-cake furnace, and the sodium and aluminium furnaces designed by Mr. Cullen for the Castner-process aluminium works at Oldbury, the author must content himself with believing that before many years have passed, the rising price of fuel will have increased the number of chemical and alkali works in which the use of gaseous fuel will have superseded the employment of solid smoke-making coal. Whether Sheffield will by this means become in our day as clean and clear in its centre as it is beautiful in its suburban surroundings is beyond any present means of calculation. The old workmen, who can never be led to believe that there can be any useful heat without much visible smoke, are being replaced by younger men, wanting or inferior perhaps in many of their predecessors' best characteristics, but more and more convinced of the necessity for employing the cheaper forms of fuel available in the furnaces reviewed in the present paper.

In conclusion, the author asks for indulgence from the many inventors, engineers, and other pioneers in the use of gaseous fuel, whose valuable and original discoveries in this process of manufacturing industry he has omitted to notice, either from ignorance, or through inadvertence, or from the necessity of keeping this paper within reasonable limits. No attempt has been made to examine the chemical actions or reactions in the various furnaces described; nor to treat in any way of the thermic value of fuel used in a gas furnace as opposed to one fired with solid coal.

Legal.

IN THE HIGH COURT OF JUSTICE—QUEEN'S BENCH DIVISION.

(Before MR. JUSTICE DAY, *without a Jury.)*

MASON AND BARRY (LIMITED), *v.* THE COMPTOIR D'ESCOMPTE.

WHEN the Court adjourned on Saturday the evidence for the defendants was closed, and the plaintiffs now called expert evidence of French lawyers to rebut the expert evidence given on behalf of the defendants.

M. Cresson, called by Mr. Finlay for the defendants, said he was Batonnier of the French Bar. He had seen the statutes of the Comptoir d'Escompte, also the contract and the guarantee. He had heard and followed the evidence. He had followed the circumstances of the

case. He had no doubt that the obligation to pay Mason and Barry resulted from the powers given to the Comptoir by the Board of Directors. The reasons were of two kinds. (1) One resulted from the person who drew up the statutes. (2) From the text itself. The statutes related back to 1848, created immediately after the revolution of that year. The idea of the persons who drew up the statutes was to assist commerce, and facilitate its operations. The State wished to facilitate the small trade for which the Comptoir was created, and wished to give the directors of the Comptoir d'Escompte the widest powers. The Board of Directors had the widest powers. Article 29 gave the manager of the Comptoir considerable powers. He could sign all agreements, contracts, and transactions. Article 8 (1) gave general power without limitation, (4) authorized the guarantee given by the Comptoir. The Comptoir could pay it, therefore, could guarantee. It was well understood that the Comptoir could give guarantees, for by Article 12 of the statutes, the words were "or the guarantee of the Comptoir." The Board had the sovereign power to admit the credit of account of its correspondents upon any securities, of the value of which they were sole judges, and no person outside the administration could know of what the credit of the account was composed. The contract must be interpreted only by French law, which requires it to be construed in good faith. There could be no illegality in an illicit affair, except as regards those who took a voluntary part in the illicit operation. Question.—In case of a letter to the copper ring he would not be prevented from recovering from the ring, or from the guarantor, by the fact that the copper was bought for the purpose of the ring? Answer.—Not unless he had taken part voluntarily in the offence. Question.—Suppose the seller of goods to be member of a ring, would that prevent the price being recovered? Answer.—If he was not an accomplice he could recover the price.

Cross-examined.—The statutes had changed in detail, but he did not think they had done so in respect of the powers conferred. He relied upon the whole of the expressions in the statutes, and in particular Articles 8 and 12, giving power to give a guarantee, and he would further point out that it was not a guarantee of the contract but a guarantee of payment. That was an act of discount within Article 8. Question.—Would he say that the giving of the guarantee was a matter of discount? Answer.—Some of the directors of the Comptoir were of the opinion that it was a discount transaction. It was an act of banking discount. No security was required for guaranteeing payment in France and abroad, but in drawing and accepting drafts then security would be required. Question.—Would he say that in guaranteeing any amount no security was required? Answer.—Article 4 said the board was to judge of that; its power was unlimited. The Comptoir could guarantee payments for any amount under the direction of the Board, who were to judge of the security. In this case the Board stipulated that payment should only be against delivery of the goods. If the Board thought zero sufficient security, they could give the guarantee. The obligation to deliver the goods was the "valuers" that the Comptoir received. He believed the Comptoir received the bills of lading. The promise to deliver the goods by Mason and Barry was the "valeurs agréées." The promise here was made to a customer of the Comptoir. The statutes were not part of the public law of France. They were published in the official journals. Formerly the *sociétés anonymes* were formed by the Government, who drew up the statutes. The contract between Mason and Barry and the Société des Métaux would be illegal if they concerted together so as to bring themselves within Article 419. That question whether the Société concerted was now before the Court owing to the appeal by Secrétan. If the contract was illegal the guarantee would be illegal.

Re-examined.—If the directors took insufficient or no security the directors would be responsible, but in no way would it affect third persons who had dealt with them. The fact that a commission was paid showed the manager and directors thought it was a banking transaction.

M. Clemet, examined, said he was the legal adviser of the British Embassy and an advocate of the Court of Appeal of France. The guarantee was within the powers of the Board of the Comptoir. He thought by Clause 4 of Article 8 and Articles 12, 28, and 29 the Comptoir could undertake all payments without security—"A se charger de tous paiements et recouvrements à Paris, dans les départements et à l'étranger." If Mason and Barry, the sellers, knew of the combination to raise the price of metal, they still would be entitled to recover. Guarantee would come within the term "mandats," because it was an engagement in a commercial form.

Cross-examined.—He was advocate for the Tammarack Company in the Court of Appeal. Question.—Suppose Mason and Barry undertake to sell their product for three years, and by the same contract they engage to limit their production, could they recover? Answer.—There was no limitation of the production, as it was decided in the French Courts to be beyond the plaintiffs' production. If Mason and Barry knew what they were doing was a misdeameanour, then the contract would be illegal. The president of the Société des Métaux had been held innocent by the French Courts. A "mandat" was the same as a letter of credit.

This closed the expert evidence on the part of the plaintiffs.

Sir Horace Davey, who appeared for the Cape Copper Company v. the Comptoir d'Escompte, which case stands next in the list for hearing, said he proposed that the French expert evidence given in this case should be read in the case of the Cape Copper Company. He would have some further evidence and then address the Court.

Mr. Bigham summed up for the defendants.

Mr. Finlay replied on behalf of the plaintiffs.

Mr. Justice Day then proceeded to hear the case of

THE CAPE COPPER COMPANY (LTD.) *v.* THE COMPTOIR D'ESCOMPTE AND THE SOCIETE INDUSTRIELLE ET COMMERCIALE DES METAUX.

In this action the issues were similar to those in the previous case of Mason and Barry, Limited. After hearing the arguments and expert evidence

Mr. Justice Day, in giving judgment in both actions, said it would be convenient to deal with the Société des Métaux before the case of the Comptoir d'Escompte. The causes of action all arose out of the same set of circumstances. In 1887 a combination—he would not say conspiracy—was formed in Paris, with assistance derived from London, to effect a purpose undoubtedly illegal according to French law, and subjecting the parties to criminal proceedings by French law, and which a few years ago would have subjected the parties to a prosecution according to English law. The combination was to raise the price by limiting the production, and thereby to extort money from those who had to use copper. In January, 1888, Morrison and Kekewich and Co. wrote letters about the success the operations had effected in raising the price of copper, and they invited Messrs. Mason and Barry in one case and the Cape Copper Company to join the scheme, which had for its object the advancement of the price and limiting the production of copper. He entertained no doubt that the contracts restricted the output, and tended to the advancement of price, and were fraudulent operations within Article 419 of the French Code. The scheme was known by Mason and Barry and the Cape Copper Company, and aided and abetted by the Comptoir d'Escompte. The Comptoir was a discount company, and it undertook to finance these operations. It was a *société anonyme*, essentially a French company, and it pleaded that the transactions were beyond the powers of the directors, and were also illegal. The Société des Métaux did not suggest that the directors did anything that was not authorised. No question arose as to the directors entering into the contracts. The only defence the Société set up was really based upon their liquidation, and they said they could not be sued. He felt bound to say the defences of the Société were groundless. The decision in the French Courts did not affect the rights to sue in this country. The French law of bankruptcy did not affect actions brought in England on English contracts. He therefore dismissed at once all the defences of the Société based on their liquidation. Then it was said the contracts were illegal. He would deal with that when he came to deal with the defences of the Comptoir d'Escompte. It was clear, looking at the contracts, that there was no scheme to raise the price of copper in France. The gist of the contracts was to raise the price of copper, and the field contemplated was mainly England, and he could not see that it was a violation of the French law. There was no question of *ultra vires* on the part of the Société. Without the slightest hesitation, he came to the conclusion they were English contracts. The negotiations took place in London; the sellers were gentlemen in England; when signed in Paris the contracts were delivered by the buyers to the sellers in England. The contracts were to be tested by English law, and in his opinion they were not illegal. The gist of the contracts was not restriction of output but engrossing. A mere contract to restrict output would not now be illegal by English law. He spoke merely of agreements restricting the output of goods. The only head of illegality was engrossing, but since the passing of the Statute 7 and 8 Victoria, c. 24, engrossing was neither punishable nor illegal. The defence of illegality, whether set up by the Comptoir or Société, therefore failed. Judgment would, therefore, pass against the Société des Métaux. The one remaining question was whether or not the guarantees were *ultra vires*.

The Comptoir purported to be a discount company, and it was said the giving of the guarantees was beyond its powers. *Primâ facie*, if one did not look at the statutes it would be said that its objects were discounting, making advances on bills, &c. The Comptoir have no doubt entered into indefinite engagements, over a long period, involving large sums of money. The transactions are certainly not such as one would expect a discount house would deal in. If it had been a private discount house which had engaged in such transactions, still one would have thought that they had engaged in a business very different from that indicated by their name. If it had been the case of

a company carrying on business in London, he would have entertained no doubt that such transactions were not within the province of its business. But that was not all. The Comptoir was an incorporated body. In France, the powers of companies were limited by their statutes, and it had been urged that the Comptoir had power under its statutes to give guarantees. He had the statutes before him. His Lordship referred to article 8 (4)—"undertaking all payments and recoveries in Paris, in the departments and abroad." Could there be any possibility of a doubt what those words meant? Making payments abroad was well understood in banking circles, and was what all bankers did for their customers. It did not mean that you could enter into guarantees. His Lordship further read: "grant and accept all orders, cheques, drafts, and bills of exchange for which cover has been previously given." It was not necessary to say whether "cover" was absolutely a condition precedent or was merely directory. The clause only applied to granting all *mandats* which meant orders for the payment of money. A *mandat* was not a guarantee; it was in the nature of a cheque, draft, or bill of exchange. But he had no hesitation in saying there was no security of any kind for, or in respect of, the giving of the guarantees. His lordship next referred to article 12 of the Comptoir's statutes, and, continuing, said: "it did not extend the powers. These transactions were utterly without the power of a discount concern, such as the Comptoir. He could only refer to the directors of the Cape Copper Company, who called together their share-holders and got their consent. Transactions such as these were not within the business of a discount house, and were certainly not within its statutes. He held, therefore, that the transactions were utterly beyond all powers of the Comptoir, and were *ultra vires*, and, therefore, he gave judgment for the Comptoir d'Escompte, with costs. Judgment would go for the Cape Copper Company against the Société des Métaux for £204,922.

Mr. ATKINSON asked that the judgment should not be against the liquidators.

Mr. JUSTICE DAY said he would give judgement against all, but not to be enforced against the liquidators.

Upon an application of the ATTORNEY-GENERAL for the costs of the shorthand notes,

Mr. JUSTICE DAY, in granting the application, said he thought one of the best reforms that could be introduced into the Courts would be that an official shorthand writer should attend in each Court and take note of all that took place.

Mr. ATKINSON, on behalf of the Société des Métaux, asked that execution should not be issued against the assets of the Société in England without notice to the liquidators.

Mr. JUSTICE DAY said he did not feel disposed to interfere.

THE PRODUCTION OF TIN.

IN the very earliest commerce of the world tin held an important position. It entered into the composition of the bronze, which was the universal material for arms and armour long before the Greeks made their famous voyage to Troy. We know that the Phœnicians braved the dangers of the Bay of Biscay to obtain it, and doubtless there were other sources less distant than Cornwall from which the people of the ancient world obtained this necessary commodity. Tin is pretty widely distributed in Europe. It was worked in the twelfth century in Bohemia and in the Meissen district of Germany. It is also found in Altenburg, Saxony, in Nantes, Limoges, and Loire Inferieure, France, in Dalicorlia, Sweden, in Spain, and of course in Cornwall, Devon, and Somerset, England. In Southern Asia, and in Siberia there are extensive deposits of tin ore, while it is also found in Madagascar, Burmah, Australia, Peru and China, Brazil, Bolivia, Tasmania, and Chili. In the United States it is found in the States of Massachusetts, New Hampshire, in the magnetic ores of New York, New Jersey, Missouri; also in the vicinity of King's Mountain, North Carolina; in the gold-bearing formations of Virginia; also in Dakota, Wyoming, Utah, and California. Many of the sources we have enumerated cannot now be worked profitably, but it is possible that in the early ages of the world they provided the local supplies.

It is estimated that the consumption of tin in the year 1888 amounted to 52,500 tons, distributed as follows:—

	Tons.
United States	16,000
Europe	8,000
Other countries	6,000
Used for tin-plates	22,500
Total	52,500

The first three items refer to pig tin only, the tin used for tin-plate being separately enumerated in the fourth line. It is estimated that another 4,000 tons would be in store and afloat. The sources of the supply are as follows:—

	Tons.
Great Britain	9,241
The islands of Banca, Billerton, Sing Kib and Java, Malacca, and Siak	27,990
Australia	6,559
Mexico, Bolivia, Peru, Chili, Argentine Republic, Tasmania, China, Spain, France, Belgium, Holland, Germany, Russia, and other parts	12,710
Total	56,500

The amount manufactured into tin-plate was distributed as follows:—

		Tons.
United States	5,500,000 boxes weighing	368,300
Great Britain	1,000,000 ,, ,,	67,000
Elsewhere	1,900,000 ,, ,,	127,200
Total	8,400,000 ,, ,,	562,500

The records of the Cornish mines have been very carefully kept for a long time, and show clearly the history of the industry. During the 147 years ending in 1889, the average output of the country has been 385,000 tons of ore, yielding 7,045 tons (or 1·83%) of black tin, and 4,620 tons (or 1·2%) of white tin. The average price of the metal during the period has been £100. 0s. 8d. per ton; it is estimated that the average cost of mining and reducing 1 ton of ore to black tin has been (including lord's dues and rates, 1s.) 18s. per ton. The average cost of black tin over the period has been £55. 3s. 3d., and the cost of producing it £49. 2s. 1d.

During the 147 years the total ore mined was about 56,500,000 tons, and from this there were produced 1,035,503 tons of black tin and 684,623 tons of metal. The highest price of metallic tin was in 1823, when it stood at £184. a ton, and the lowest was in 1843, when it had dropped to £60. a ton. Since 1869 the output has been very steady; in 1874, 230 mines produced 9,942 tons, this being the highest number of mines worked. In 1886 the number had fallen to 72, yet the production, 9,241 tons, had not greatly decreased. In 1888 the output of 81 mines was 9,183 tons.

Within an area four miles long by three miles broad in the Dolcoath district, there are 51 tin mines, and it is estimated that 25 of these mines have made over £5,000,000. sterling in profits from the sale of black tin; one mine alone made £2,000,000. This mine, the Dolcoath, has an output of 200 tons of ore per day, yielding the high amount of 2·4% of pig tin, as against 1½% for the average of fourteen other principal mines. It cost £60. per ton of pig to produce the tin from the ore, and the lord's dues amount to £8.

The fact that Cornish mines are under supervision on account of the lord's dues has caused very accurate records to be made of the output for over a long period:—

Output of Cornish Mines—1742 to 1888.

Dates.	Number of Years.	Tons of Metal Produced.	Average Price—Total Value per Ton. £	s.	d.
1742 to 1799	58	156,533	88	7	3
1800 ,, 1847	48	162,981	99	11	5
1848 ,, 1857	10	90,180	106	4	2
1858 ,, 1863	6	42,565	123	5	9
1864 ,, 1869	6	51,510	100	5	0
1870	1	10,200	127	8	6
1871	1	11,320	137	10	2
1872	1	9,560	152	15	0
1873	1	9,972	133	7	0
1874	1	9,942	108	8	0
1875	1	9,614	90	2	0
1876	1	8,500	79	10	2
1877	1	9,500	73	3	6
1878	1	10,106	65	12	3
1879	1	9,532	72	6	0
1880	1	8,918	91	5	0
1881	1	8,615	97	9	3
1882	1	9,320	106	14	0
1883	1	9,262	97	1	6
1884	1	9,559	84	11	6
1885	1	9,296	89	7	2
1886	1	9,241	101	8	6
1887	1	9,214	113	0	0
1888	1	9,183	117	5	6
		684,623	Average 100	0	8

The tin ore (black tin) contained in the vein stone (lodes) of 26 of the principal tin mines of Cornwall in 1869 amounted to an average of 47 lb. avoirdupois in the ton, or about 2·1% of black tin; equal to 1·4% of pig tin per ton of ore mined and reduced. The amount of ore and waste mined in the period covered by the table was about 70,000,000 tons.

Taking two periods, each of sixteen weeks, in 1888 and 1889 respectively, the average cost per ton of mining ore in 25 of the tin mines in Cornwall was £1. 3s. 2d., the lowest being 16s. 7d., and the highest being £1. 12s There were raised 242,200 tons of ore, which yielded 5,466¾ tons of black tin. During the former period (1888) the average price paid for black tin by the smelter was £88. 1s. 10d., and in the latter period (1889) £53. 0s. 6d. Refined English tin sold from £170. a ton in February, 1888.

The following table gives the cost per ton for producing metallic tin rom ores assaying from 1% upwards:—

TABLE SHOWING ESTIMATED COST OF PRODUCING METALLIC TIN FROM ORES.

		£	s.	d.										
Profit per Day for 100 Tons of Ore Mined; Metal at £100. a Ton.		22	11	8	loss		4	1	18	13	16	1	229	
			8	8	" profit				4	4	8	8		
Cost of Producing Pig Tin per Ton of Ore Mined.		1	4	6			1	5	2	5	10	11	13	15
			4	10				5		5	10	12	13	
												1		
Cost of Producing Metal per Ton.		122	11	8		103	8	7	84	11	1	64	13	4	68	8	1	56	1	1	43	12	3
Total Cost of Production from 100 Tons of Ore.		122	11	8		124	1	8	126	1	8	129	6	8	164	11	4	168	3	4	174	18	4
Cost per Ton of Smelting Black Tin containing 66% of Metal.		6	15	0		8	5	0	10	5	0	13	10	0	16	13	0	20	5	0	27		
Cost per 100 Tons of Ores.	Total Cost of Production.	155	16	8		115	16	8	115	16	8	115	16	8	147	18	4	147	18	4	147	18	4
	Cost of Milling and Concentrating.	25	16	0		25	16	0	25	16	0	25	16	0	32	1	8	32	1	8	32	1	8
	Cost of Mining, Lord's Dues, and Transportation.	90	0	0		90	0	0	90	0	0	90	0	0	115	16	8	115	16	8	115	16	8
Per Cent of Black Tin.		1·5				1·83			2·27			3			3·7			4·5			6			30
Per Cent. of Metal.		1				1·2			1·5			2			2·4			3			4			20

This table shows that in Cornwall it does not pay to work a mine in which the ore only assays 1% of metal or 1½% of black tin, and that upon a daily output of 100 tons of ore there would be a loss of £22. 11s. 8d. per day. Even at 1·2% of metal there would be a slight loss of £4. 1s. 8d. per day. With 1½% of metal the profit would be £23. 18s. 4d. per day, and with 4% the figure rises to the splendid sum of £229. 1s. 8d. With percentages varying from 5 to 20, as found at Temescal in California, the estimated profits rise to sums which perfectly dazzle the mind. This is exactly what estimated mining profits always do, and occasionally the reality is very good, as for instance at the Dolcoath Mine, where shares with £9. 12s. 6d. paid stand at £100.

Australia produces large amounts of tin. According to Parliamentary returns there had been imported from that continent, up to the end of 1888, 129,016 tons. The first amount exported was 151 tons in 1872; this rose to 2,472 tons in 1873, and to 5,067 tons in 1874. There was a continuous increase up to 10,964 tons in 1883, from which point there was a steady decline to 6,559 tons in 1888. Tasmania has supplied a large amount of tin, the value of its export between 1872 and 1888 being £4,103,760. The lodes are very rich, and fresh ones have recently been opened out. Hitherto scarcely any deep operations have been attempted. In New South Wales there are considerable placer mines, where the metal is obtained by washing. In the counties of Clark and Gresham, in the district of New England, there are 500 acres in which deposits of tin and gold are found in alluvial wash.

There have been many attempts to work tin mines in the United States of America, but hitherto they have not met with much success. At Harney Peak, Dakota, great hopes are entertained, and a large number of lodes have been opened out. The Harney Peak tin district presents a circular belt of tin-bearing micaceous slate, formed by a huge cone of bare granite, pushed up into the air 8,000 ft. through layers of slate, carboniferous limestone, and red sandstone. Time has eaten away much of the slate around the peak, and laid bare the tin veins, the débris has run into the gulches, and there formed tin placers, known as stream tin. The black tin is disseminated in a granular rock called greisen. There is quartz bearing tin ores, granite veins bearing tin stone, and tin stone in nodular masses. The property is in the hands of a strong syndicate, and is being systematically explored, before commercial operations are commenced. Again, in Wyoming, in 1884, there was the prospect that the production of American tin might become an established industry. Several mines were opened out, and a mill was erected, but the enterprise did not prosper as was anticipated. In Virginia there occurs the Martha Cash tin district, measuring ten miles by four miles. Forty mines have been tested, and these have been found carrying 23 lb. of metal to the ton of ore, or 1%. The workable ore exists altogether in lumps and veins clearly definable. The ore is cassiterite, or binoxide of tin. A tin deposit also exists at King's Mountain, North Carolina; the deposits are long and narrow.

By far the most promising tin district of America is that of Temescal, in San Bernardino County, California. It is said to bear a striking resemblance to the geological formation of that part of Cornwall in which the most productive mines are situated. Samples from lodes have been assayed by various experts in England and America, the average result being 20% of metal to the ton of ore, which is of course enormously above the best results obtained in Cornwall.

A strong effort is being made in America to impose import duties upon tin-plate, and if this is successful it will open a new industry to the country, as at present all the tin plate is imported. If the protectionist party should succeed, the value of the local mines will be enhanced, while the tin-plate trade of South Wales will be depressed very seriously.—*Engineering.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

"FLUX."—The liquid is simply chloride of zinc. Use it sparingly.

A. DAVIDSON.—We cannot publish the particulars; your best plan would be to call at our office.

"ASBESTOS."—The information was given fully in volume two of this Journal.

A. H. and Co.—We should say employ a properly trained chemist; had you done so sooner, you would probably have avoided all the trouble and loss.

"B."—If you turn your "waste *water*," as you call it, into the river, you will soon be in trouble. Surely you can profitably utilize such a liquor.

CLEMENTSON.—Yes. Chlorate of potash. Nitrate would not do. Be careful with the strychnine.

AN OLD SUBSCRIBER.—You should not have parted with your back numbers, as they contain just what you ask for.

We do not hold ourselves responsible for the opinions expressed by our correspondents.

PROFITABLE EXTRAS FOR CHEMISTS.

To the Editor of the Chemical Trade Journal.

SIR,—In your article on "Profitable Extras for Chemists" from the analyst's standpoint, you have done analysts a service, individually and collectively. I crave your indulgence and a little of your space to say a few words. I am an analyst—not a bad one, if I may judge as a business man from the way in which my results are sought after and dealt with. I am a Fellow of the Institute of Chemistry *by examination.* A year or two ago, when less known, and as a consequence less

prosperous, I seriously took up the subject of adding to my other business that of a dispensing chemist and retailer of poisons. How bitterly was I disappointed. I am a good Latin scholar, I am at least a fair chemist, I am a good analyst, and further proof of this is not necessary when I repeat that I am a Fellow of the Institute of Chemistry, yet when I desired to take up what is euphemistically called pharmaceutical *chemistry*, I found that unless I spent some three years behind a counter grinding pills and fetching things up out of the cellar, at either no remuneration, or, a premium and a slight return, and passed something called a Minor and a Major, whatever that may be, I could not practice, or, if I did, I should be prosecuted or persecuted (I am not sure which) by a corporation of apothecaries, which it seems is a little more zealous in the interests of pharmacists, than is the Institute of Chemistry in ours. The whole situation amounts to two things, firstly, that analysts may not practice as pharmacists, however competent they may be, while pharmacists may practice as analysts without let or hindrance, *however incompetent* they may be; secondly, it is a grievous injustice to analytical chemists, and ought to be done away with at once, either by protecting analysts, as pharmacists are protected, or by throwing open to analysts the trade of dispensing medicines and selling poisons.

I apologise for trespassing on your space. I enclose my card, and am,—yours faithfully, HARD LINES.

Trade Notes.

A USEFUL ALLOY.—An alloy that expands in cooling and is suitable for repairing cracks in cast iron is made with nine parts of lead, two of antimony, and one of bismuth.

THE DISCOVERY OF COAL IN KENT.—Some enthusiasts are anticipating the advent of a Kentish coal trade and a restoration of the Kentish iron industry, or perhaps it would be more strictly historical to say the Sussex iron industries, though one of the largest furnaces was at Lamberhurst, now wholly within the county of Kent. It was there that the balustrade around St. Paul's was cast at a cost of £11,000. Buxted was famous for its iron ordnance, and there was a brisk trade done in fire locks and iron grave "stones," which were exported from Rye. The last furnace was at Brede, near Beckley, a few miles from Rye, which was discontinued in 1825.

REFUSAL OF A ROYAL COMMISSION ON SALT SUBSIDENCE.—The Northwich and Winsford Local Boards and property owners, having without success sought, as recommended by Mr. Ritchie, an amicable settlement with the Salt Union and other brine pumpers on the question of compensation for the injuries caused to property in the district by subsidence due to the pumping of brine, once more petitioned Mr. Ritchie and the Local Government Board to receive a deputation. A reply was received yesterday from the Local Government Board from which the following is a quotation:—"The President, as he has already stated, is of opinion that the matter is one for legislation rather than for inquiry by Royal Commission, and he does not anticipate that any advantage would result from the attendance of a further deputation as suggested." This reply has caused much disappointment in the district.

THE TRADE IN TUSCAN OLIVE OIL.—Olive oil is still an important article of export from Leghorn, which is the focus of the Tuscan olive oil trade, and the olive oil of Tuscany still maintains a high reputation as a pure oil for table use. But a considerable decline is noticeable in the export of this as well as of most of the agricultural products of the country. According to the last Consular report from Leghorn, in 1882 and 1883 the olive oil exported from Leghorn amounted to 4,813 tons and 4,132 tons respectively, whereas in 1887 the total export had fallen to 3,811 tons, and in 1888 to 2,109 tons. The proportion of the whole export which goes to the United Kingdom shows, however a slight increase. The trade to the United Kingdom in Tuscan oil is almost wholly in the hands of one large English firm long established in Leghorn, and four-fifths of the oil sent to Great Britain is sent direct to London in their own steamers. The best quality of Tuscan olive oil, known in the trade as "Lucca oil," is shipped in casks, not in flasks, to one or two of the leading Italian warehouses in London, and is there bottled, labelled, and distributed through grocers to the public. The deception, to which attention has been called once or twice, of sending empty "Florence flasks" to the United Kingdom, there to be filled with any adulterated compound, or with cotton-seed oil pure and simple, still continues, but in a diminishing degree, so it may be concluded that the public is getting alive to the imposition in that manner practised. The rupture of commercial relations with France has seriously affected the export of this product to Marseilles, Nice, and Bordeaux, and very little is now sent to France from Leghorn.

Market Reports.

REPORT ON MANURE MATERIAL.

Business during the past week has been a good deal interrupted by the holidays, and we do not hear of any extensive transactions either in phosphatic or nitrogenous material. Prices remain for the most part without change.

For Charleston phosphate rock 11d. per unit for River, and 10d. per unit for Land, would still be the lowest prices for cargoes c.f. and i. to U.K. There is a good demand for Canadian rock, and 1s. 4d. for 80%, 1s. 2½d. for 75%, and 12½d. for 70%, full delivered terms, one-fifth rise, would have to be paid. Offers under these figures have been made, and so far have not led to business. There is business passing in the medium grades of Somme at somewhat easier prices, but in Belgian there is no change in prices.

The market for bones is very firm in all positions. £5. 10s. for U.K. is still nearest value of River Plate cargoes, summer shipment. No sales reported during the week. For crushed Kurrachee bones, £5. 5s. to £5. 7s. 6d, according to port, must be quoted as nearest value for autumn shipment, and £5. 12s. 6d. for East Indian bone meal for shipment ahead. There is a good demand for grinding bones for charring purposes, and up to £5. 8s. 9d. has been paid at Liverpool.

There is nothing of special interest to report in nitrate of soda. Spot value is 8s. 3d. for ordinary, and 8s. 6d. for refined. Due cargoes are worth 8s. 2¼d. to 8s. 3d., according to size; later shipments 8s. 6d. to 8s. 9d. For refined, 3d. more would readily be obtained.

Further sales of home prepared dried blood have been made, but prices have not been reported.

We do not hear of any business in ground hoof and horn, there being not much offering, and sellers requiring some advance on prices accepted a few weeks ago.

Nothing offering in River Plate guanos.

MISCELLANEOUS CHEMICAL MARKET.

Bleaching powder has been rather easier in price during the week for spot deliveries, and £5. 5s. per ton on rails at maker's works may be taken as nearest market value. The position of caustic soda is also less firm than it was, and business has been done at lower rates. Quotations to-day are, for 70% £9. 15s. to £9. 17s. 6d., and 74% £10. 5s. to £10. 7s. 6d., f.o.b. Liverpool. On the Tyne, 77% is at £10. 15s. f.o.b. Quotations for soda ash and crystals are steady. Chlorate of potash, 5d. per lb. Forward quotations for all products of the alkali trade have been restricted for deliveries to end of September, but pending settlement of the proposed Union, the Committee are disposed now to extend the period of their engagements. Vitriol is in smaller demand, and price is nominally 24s. to 25s. per ton for ordinary brown. Muriatic acid, quiet, but without alteration in value. Recovered sulphur in steady demand, and prices firm at £4. 2s. 6d. to £4. 5s. per ton, in bulk, at maker's works. Sulphate of copper shows no sign of recovery at present, and in small quantities is selling at £18. to £18. 10s. per ton at usual points. Lead acetate is in better demand and firmer in price. Brown acetate of lime is dull, and £7. per ton on the spot may be taken as current value. Acetic acids, without change. Acetate of soda less plentiful, and firm in price. Demand continues good for potash, carbonate, and caustic, and prices have slightly improved. Yellow prussiate of potash continues scarce, and firm in price at 9½d. per lb. Bichromates are moving more freely. Carbolic acid crystals are stationary at 7½d. to 7¾d. for 34/35°, though manufacturers are more disposed to entertain business at the lower prices. Picric acid, quiet at 1s. 1d. per lb. Tartaric, without movement. Oxalic acid, dull at 3½d. to 3⅝d. per lb.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron is firmer, and the price of Scotch warrants has risen during the week. Manufactured iron is steady, and orders are more readily placed. Scotch pig iron done at 46s. 10½d. cash, and 47s. 1½d. one month. Middlesbrough 44s. 3d. cash. Hematite 54s. 6d. cash. Copper firm: Chili bars, G.M.B.'s and G.O.B.'s £57. 10s. to £57. 12s. 6d. cash and £58. three months.

Sulphate of copper is firmer, production having been considerably curtailed. Tin firmly maintained: Straits £94. 10s. to £94. 12s. 6d. cash, £94. 12s. 6d. 20th inst., and £95. three months; Australian £94. 15s. cash; English ingots £97. 10s. to £98. Spelter: Silesian ordinary, £23. 10s. Quicksilver, £10. 1s. second hands. Copper shares: Cape Copper Co. 4 7/16; Libiola 2 8/16; Rio Tinto 22 3/8 to 22 7/16.

GLASGOW, Wednesday.—There was a strong tone in the pig-iron market this morning, and a good business was done at 46s. 7½d., 46s. 6½d. to 47s. 0½d. cash, and 46s. 10d. to 47s. 3d. one month; buyers at noon 46s. 11½d. cash, sellers 47s. In the afternoon the market was irregular, a good business being done at 47s., 46s. 11d., 47s. 1½d., to 46s. 11½d. cash, and 47s. 3d., 47s. 2d., to 47s. 4½d. one month; closing buyers at 46s. 11d. cash. Middlesbrough warrants were dealt in at 44s. 6d. one month; closing buyers at 44s. 3d. cash, sellers 44s. 6d. Hematites were done at 54s. 6d., 54s. 7½d., to 54s. 6½d. cash, and 54s. 9d. one month; closing buyers at 54s. 6½d. cash, sellers 1d. per ton more.

WOLVERHAMPTON, Wednesday.—The reports brought to 'Change this afternoon indicated an improved state of trade. The sheet iron department was better. Singles changed hands at £7. 5s., and doubles and trebles £8. 15s. Marked bars sold at £8. 10s., and common at £7. upwards. Hoops were £7. 10s., and gas tube strip was £7. 2s. 6d. Pigs were in better demand, at unaltered prices.

TAR AND AMMONIA PRODUCTS.

The benzol market preserves a firm attitude, and there is every reason to believe that prices will go slightly higher, though at present no upward move in values is discernible; 4s. for 90's and 3s. for 50/90's may be said to be the minimum values. Solvent naphtha continues in good demand, especially for the odourless product. Crude carbolic is still lingering, and purchasers are endeavouring to cover their requirements at the lowest possible cost. Improvements in the manufacture of picric acid may perhaps improve the position of crystal carbolic, but this is hardly assured yet. Anthracene remains in much the same position as quoted last week, and prices have neither advanced nor receded. The pitch market is weak, but little business being doing.

In sulphate of ammonia there has not been much offering during the holidays, but there is a very good enquiry, America being still well to the fore. Quotations remain at £11. 10s. for Hull, but at Liverpool £11. 12s. 6d. is asked and paid. At Leith re-sales are being made at £11. 6s. 3d., but seeing the scarcity of prompt parcels at Liverpool and Hull, a continuance of the present demand is bound to force prices up.

THE LIVERPOOL COLOUR MARKET.

Colours unchanged. Ochres: Oxfordshire has been quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc: V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

THE COPPER MARKET.

Messrs. Harrington and Co.'s copper report, dated Liverpool, August 1, states: Chili copper charters for second half of July are advised as 800 tons fine. Exchange 23½d. The total charters since 1st January have been 14,200 tons, against 13,400 tons for same time last year. In our last issue copper G.M.B's. closed at £57. 15s. cash and £58. 10s. three months. A fair business has been done since then at a decline of about 20s. per ton, and we close steady to-day at £57. and £57. 10s. respectively. About the 25th July a sale of 2,800 tons Rio Tinto Cake Copper was made by French holders, and the price reported was £60. 5s. per ton. It is now supposed that they only hold about 3,000 tons of Cape Copper, best selected, which is not available at present on account of legal difficulties. Anaconda matte—old syndicate stock: We believe about 500 tons have been shipped to America, and that in all probability 1,000 tons more will follow. Swansea stock of Chili bars has again been increased by 201 tons from Havre, making the Swansea stock 851 tons. The present stock of English G.M.B's. in warehouse, Liverpool and Swansea, is 4,533 tons, against 4,779 tons on the 15th ult., showing a decrease of 246 tons, of which 107 tons from Liverpool and 139 tons from Swansea. The total decrease for the fortnight in the Liverpool, Swansea, London, and Havre stocks is 616 tons. The sales of furnace material comprise: At Liverpool, 240 tons Italian ore, at 9s. 9d. to 10s.; 2,515 tons ordinary Anaconda matte, out of old stock (re-sales), at 11s. 6d. down to 11s. 3d.; 1,100 tons Mason's and other precipitate (re-sale), out of old stock, at 10s. 9d.; 213 tons English precipitate (seller's works), from 11s. 6d. to 12s. 3d., and 26 tons seconds (about 26%), at 10s. 9d.; 30 tons Seville precipitate, at 12s. 3d.; 67 tons Brazilian ore, at 11s. 4½d.; 11 tons Peruvian ore, at 11s.; 500 tons Portugese ore, to arrive, low produce, at 9s. 9d.; 105 tons Alosno precipitate, at 11s. 7½d.; and 60 tons Spanish ore (Penaflor), at 10s. 6d. per unit. At Swansea, 130 tons Libiola ore, at 10s. 3d. per unit.

THE TYNE CHEMICAL REPORT.

Tuesday.

There is little change to report in the chemical market this week. Business on the whole has been quiet but prices are firm. Soda crystals are slightly better in price. Caustic soda and soda ash continue steady at previous quotations. Sulphate of soda unchanged. Bleaching powder for prompt is a little easier and in buyers' favour at the moment.

Current quotations are as follows:—Bleaching powder, prompt delivery, £5. 5s. to £5. 7s. 6d. per ton in softwood casks, and £5. 10s. to £5. 12s. 6d. per ton in hardwood casks; higher prices asked for delivery to end of September; caustic soda, 77%, £10. 10s. per ton; ground and packed in 3-4 cwt. barrels, £13. 10s. per ton; soda ash, 48/52%, 1 3/16d. per degree less 5%; soda crystals, £2. 13s. 6d. to £2. 15s. per ton; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £5. 15s. per ton; in 5-7 cwt. casks, £5. 5s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

The market for small coals for manufacturing purposes is very stiff, owing to impending strike in the South Wales district. Northumberland steam small quoted from 7s. to 7s. 6d. per ton, and Durham small quoted from 7s. to 8s. per ton, according to quality.

The following is a list of chemicals exported from the Tyne for the month of July, 1890, and corresponding period of 1889.

	1889	1890
Alkali and Soda Ash	1,141 tons.	1,267 tons.
Bicarbonate of Soda	14 ,,	
Bleaching Powder	1,736 ,,	2,808 ,,
Manure.....	2,854 ,,	3,931 ,,
Soda Crystals	1,047 ,,	982 ,,
Sulphate of Soda.....	10 ,,	42 ,,
Caustic Soda		910 ,,
Other Chemicals	1,752 ,,	1,115 ,,
	8,554 tons.	11,055 tons.

THE LIVERPOOL MINERAL MARKET.

Our market continues firm, and prices generally have been well maintained. In some cases an advance has taken place. Manganese: Arrivals have been somewhat reduced, prices, however, are unaltered. Magnesite: With considerably increased importations of raw lump, and the enormous supply over the demand, buyers can secure supplies at almost any price; raw ground, £6. 10s., and calcined ground, £10. to £11. Bauxite (Irish Hill brand) in increased demand, and present production is scarcely able to keep pace therewith, prices, therefore, are very firm: Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: There have been more arivals, but all has been wanted, and prices are unaltered; in fact, an advance is early anticipated in consequence of the falling off in supply, especially for G.G.B. "Angel White" brand,

95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate) steady; selected crystal lump is scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; selected crystal ground, £8. Sulphate firm, best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.C.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumicestone easier; ground at £10., and specially selected lump, finest quality, £13. Iron ore steady. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore unchanged. Spanish manganiferous ore in demand. Emerystone: Best brands specially inquired for, bringing full prices. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal. There is no alteration to report in prices, a fair business doing. Chrome metal, 5s. 6d. per lb. Chrome ore best qualities offer freely, and prices are easy. Antimony ore and metal in strong demand at high prices. Asbestos is in strong demand, especially rock, and prices very firm. Potter's lead ore of best and standard brands in request; powdered, £15. 10s.; smalls, £14. to £15.; selected lump, £16. to £17. Calamine: Best qualities are scarce, 60s. to 80s. Strontia steady; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.C.B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Bog ore in demand, firm, at 22s. to 25s. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, continues scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel more doing. Chrome iron unaltered at last quotations. Ground mica, £50. China clay: In view of the combination, prices are somewhat firmer—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn).

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

We are experiencing a slight lull here as contrasted with late briskness in the price market, and both caustic and bleach are a little easier than they were a week ago. Holders and makers, however, although buyers have cooled down considerably, are in no mood for letting values drop from present comparatively high level. The Union is still believed in, as being good at least for a brief time of rather arbitrary power, and some assert that the great Trust is already virtually fashioned and at work. In this quarter, as yet, however, overt signs of its existence as an articulated influence are wanting; and a few stoutly deny that parturition has taken, or ever will take place. Refined alkali and chlorate of potash are both fractionally higher in quotation; alum is dearer, and soda crystals also, the latter being impeded in the manufacture by the close, stifling atmosphere prevalent for a few days. Sulphate of ammonia continues in a position not easy of definition, and operators are inclined to ascribe a portion of the article's stiffness, to the American demand. The price here to-day for f.o.b., Leith, is about £11. 7s. 6d., rather higher than last week; but enquiry is principally for Glasgow shipment, for which a slightly better price is got. Paraffins are unchanged, but there is much interest centred in burning oil, which is to be dealt with conclusively (for another year) at tomorrow's meeting of the Scottish Mineral Oil Association. The fall is likely to be ¼d. or ½d. a gallon. Chief prices current are:—Soda crystals, 53s. 6d. net Tyne; alum in lump £5. 2s. 6d. net Glasgow; borax, English refined, £29. 10s, and boracic acid, £37. 10s, net Glasgow; soda ash, 1⅛d. less 5%, Tyne; caustic soda, white, 76°, £12., 70/72°, £9. 17s. 6d., 60/62°, £8. 17s. 6d. and cream, 60/62°, £8. 10s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s., and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1⅛d., less 5% Tyne; saltcake, 32s. to 32s. 6d.; bleaching powder, £5. 10s. to £6., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5 and 6% to Scotch and English buyers respectively (for export these prices net); chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 4½d.; sulphate of ammonia, £11. 7s. 6d. spot f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18., less 2½% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3½d.; paraffin spirit (naphtha), 7d. a gallon; paraffin oil (burning), unquotable, pending Mineral Oil Association Meeting in Glasgow, tomorrow, at which, most likely, a drop of from ¼d. to ½d. a gallon will be decided on; ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 8,849 bags.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Use of Non-Oxidising Oils for Paint-making. J. Baptista. 11,359. July 21
Use of Non-Saponifiable Oils in the Manufacture of Soap. J. Baptista. 11,360. July 21.
Conveyors for Granular Material. E. Kreiss. 11,381. July 21.
Tanning. J. E. Pujos. 11,397. July 21.
Gypsum Bricks for Building Purposes.—(Complete Specification.) A. Buecher. 11,443. July 22.
Manufacture of Coke. J. Hall. 11,452. July 22.
Boiler Furnaces. V. Symonds. 11,458. July 22.
Steam Generator.—(Complete Specification.) F. Livet. 11,472. July 22.
Treatment of Molasses. J. Duncan. 11,473. July 22.
Superphosphate Disintegrators. P. U. Askham and W. Wilson. 11,474. July 22.
Dynamos and Motors.—(Complete Specification.) E. Thompson. 11,480. July 22.
Armatures, Dynamos, and Motors. F. H. Royce. 11,490. July 23.
Incandescent Gas Lighting. A. Heald. 11,495. July 23.
Dynamos. A. E. Wadley. 11,499. July 23.
Fans and Exhausters. K. Leverkus. 11,501. July 23.
Artificial Fuel. W. Lacey. 11,514. July 23.
Steam Boilers for Utilising Waste Heat from Puddling Furnaces.—(Complete Specification.) J. Beesley. 11,515. July 23.
Device for Indicating the Condition of the Air. J. P. Bayly. 11,519. July 23.
Evaporating Brine. A. Chapman and S. Vickers, Junr. 11,529. July 23.
Artificial Indigo. B. Willcox. 11,530. July 23.
Forming Copper Ingots, Electrolytically.—(Complete Specification.) M. G. Farmer. 11,533. July 23.
Conversion of Hard-burnt, into Soft-burnt, Magnesia. F. M. Lyte and J. G. Tatters. 11,545. July 23.
Manufacture of Glass Bottles. H. M. Ashley. 11,547. July 23.
Azo Colouring Matters. J. Imray. 11,548 July 23
Extraction of Gold and Silver. W. Hornsby. 11,550. July 23.
Grinding Mills. W. Hornsby. 11,551. July 23.
Gas Regulators. G. F. Redfern. 11,553. July 23.
Sterilising Apparatus.—(Complete Specification.) G. F. Redfern. 11,545. July 23.
Drying Stoves for Bricks, &c.—(Complete Specification.) A. Schaaf. 11,560. July 23.
Black Mordant. W. Marriot. 11,580. July 24.
Retorts for Distilling Shale, &c. F. J. Rowan and H. Armour. 11,581. July 24.
Obtaining Molten Metals from Fused Oxides by Electricity. A. H. Cowles. 11,601. July 24.
Manufacture of White Lead. G. Bischof. 11,602. July 24.
Salts of Barium. P. Kestner. 11 605. July 24.
Decolourising Vegetable Oils. W. N. Hartley and W. E. B. Blenkinsop. 11,629. July 24.
Sulphate of Calcium. T. Elliot. 11,638. July 25.
Manufacture of White Lead and Nitrate of Ammonia. M. N. d'Andria. 11,640. July 25.
Centrifugal Apparatus for Separating Saccharine Juices. D. Stewart. 11,642. July 25.
Manufacture of Glass Tubing. D. Rylands and A. Husselbee. 11,651. July 25.
Apparatus for Manufacture of Finings. C. O. Gridley and A. Bishop. 11,672. July 14.
Producing Sheets of Metal by Electro-deposition.—(Complete Specification.) M. G. Farmer. 11,680. July 55.
Treatment of Beetroot. J. Duncan 11,683. July 25.
Evaporating Apparatus.—(Complete Specification.) S. M. Lillie. 11,686. July 25.
Electro-magnetic Separators. P. U. Askham and W. Wilson. 11,690. July 26.
Apparatus for Drying Sand. W. E. Heys. 11,692. July 26.
Production of Chlorine and Bromine by Electricity.—(Complete Specification.) G. Nahnsen. 11,699. July 26.
Glass-lined Tubing. D. Rylands and R. Morant. 11,714. July 26.
Filters for Sludge and other Semi-liquid Matter. T. A. Bullough. 11,719. July 26.
Brick and Tile Machinery. G. Wooliscroft and H. Todd. 11,721. July 26.
Gas Producer Furnaces. S. H. Smith. 11,740. July 26.
Vacuum Drying Apparatus for Explosives.—(Complete Specification.) H. J. Haddan. 11,745. July 26.
Method of Drying Wet Substances.—(Complete Specification.) G. U. Haslam and P. Cornish. July 26.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

RAMSAY AND WALKER, Victoria-street, Westminster, London, electrical engineers.
W. HEALEY and J. HEALEY, under the style of W. Healey, Salford and Manchester, brickmakers.
GIBBINGS BROS., Chichester, tanners.
J. T. AMBLER, T. H. MOSS, and T. CLARKE, under the style of J. Ambler and Co., Timperley, tanners and curriers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

EDMUND PANKHURST, New Cross-road, Deptford, and Rolls-road, Old Kent-road London, oil and colourman.
ADOLPHUS GRAY PETTY, Linthorpe-road, Hackney, and FRANCIS WILLIAM LODER, High-road, Lee, London (trading as Petty and Co., Silvertown, London oil refiners.

IMPORTS OF CHEMICAL PRODUCTS AT THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending July 26th.

Acetic Acid—
Holland, 2 pks. Beresford & Co.
" 9 "

Ammonia—
U. S., £116 L. & I. D. Jt. Co.
Holland, Weatherley Mead & Co.

Antimony Ore—
Germany, 5 t. H. Bath & Son
France, 21 Pillow Jones & Co.
Sydney, 10 H. Bath & Son
Bilbao, 30 H. Emanuel
Sydney, 2 Johnson, Matthey & Co.

Brimstone—
Italy, 100 t. W. C. Bacon & Co.
" 20 G. Boor & Co.

Boracic Acid—
Germany, 100 pks. A. & M. Zimmermann
Holland, 10 Ross and Deering

Barytes—
Holland, 22 cks. O'Hara & Hoar
" 22 W. Harrison & Co.
Belgium, 55 N. J. Fenner & Co.
Holland, 22 J. Skitt & Co.
" 46 D. Storer & Sons Ld.
Germany, 22 W. Harrison & Co.
" 23 cks. Constable Henderson & Co.

Bones—
Germany, 4 t. W. Klein & Sons

Bromine—
Germany, £200 A & M. Zimmermann

Barytes Nitrate—
Germany, £100 H. Lambert

Cream of Tartar—
France, 5 pks. W. C. Bacon & Co.
Spain, 2 B. & F. Wf. Co., Ld.
France, 5 "
" 5 J. Puddy & Co.
Spain, 3 pks. B. & F. Wf. Co., Ld.

Cobalt Ore—
France, 355 t. Newcomb & Co.

Copper Ore—
Norway, 4 c. W. E. Butt & Co.

Caoutchouc—
E. Indies, 199 c. Ralli Bros.
" 48 C. Scheeps & Co.
" 118 W. Pope & Co.
Singapore, 100 J. H. & G. Scovell
Zanzibar, 155 Beresford & Co.
" 45 Anderson Weber & Smith
Batavia, 3 L. & I. D. Jt. Co.
Zanzibar, 60 W. M. Smith & Sons
France, 50 Stiebel Bros.
Zanzibar, 40 Wallace Bros.
U. S., 44 Mildred Goyeneche & Co.

Chemicals *(otherwise undescribed)*
Holland, £10 Phillipps & Graves
Germany, 548 Craven & Co.
" 12 Petri Bros.
" 53 Spies Bros. & Co.
" 103 W. Balchin
" 18 T. H. Lee
" 61 Phillips & Graves
" 450 A. M. Zimmermann
" 111 W. Burton & Sons

Dyestuffs—
Cochineal
E. Indies, 4 pks. W. M. Smith & Sons
Yellow Berries
Smyrna, 30 bgs. Major & Field
France, 4 brls. Moise Rehar & Co.
Annatto
E. Indies, 14 pks. Hoare Wilson & Co.
France, 4 Hurford & Middleton
Argols
Cape Town, 4 pks. Borradaile & Co.
Extracts
U. S., 50 pks. W. Burton & Sons
France, 370 L. J. Levinstein & Sons
Halifax, 600 A. J. Humphrey
Austria, 300 "
Halifax, 302 T. Ronaldson & Son
Tanners' Bark
Sydney, 540 t. Dalgety & Co.
Adelaide, 57 Devitt & Hett
U. S., 21 J. Graves

Tanners' Bark—*continued.*
Holland, 50 Fandell & Co.
" 23 Sawer Mead & Co.
Durban, 92 A. & W. Nesbitt
Natal, 80 Hicks Nash & Co.
Melbourne, 232 Baxter & Hoare
Germany, 2 Beresford & Co.
Holland, 10 Revington & Sons
" 38 J. J. Williamson & Sons
Melbourne, 24 Baxter & Hoare
Orchella
E. Indies, 23 pks. L. & I. D. Jt. Co.
Valonia
Smyrna, 212 t. J. Graves
" 100 Adam Bros.
Sumac
Italy, 100 chts. F. Roberts
" 300 pks. W. Sheleott
Indigo
E. Indies, 4 chts. L. & I. D. Jt. Co.
" 3 Arbuthnot Latham & Co.
Germany, 13 L. & I. D. Jt. Co.
" 2 cs. Patry & Pasteur
Cutch
E. Indies, 200 chts. Wrightson & Son
Myrabolams
E. Indies, 108 chts. L. & I. D. Jt. Co.
" 304 "
Saffron
Spain, 1 cht. Pickford & Co.
Alizarine
Holland, 52 pks. J. Forsey
Fustic
Jamaica, 48 t. Lewis & Peat
Anthracene
Holland, 16 cks. Burt Boulton & Co.
Gambier
Singapore, 427 chts. J. H. & G. Scovell
U. S., 126 T. J. & T. Powell
Singapore, 300 R. & J. Henderson
" 408 pks. Beresford & Co.
Dyestuffs *(otherwise undescribed)*
E. Indies, 227 pks. J. Forsey
U. S., 2 Hatrick & Co.

Glycerine—
Germany, £110 G. Stoller & Co.
France, 17 Van Gulkerken & Co.
Germany, 60 Beresford & Co.

Glucose—
U. S., 849 pks. 1,539 cwts. Union Lighterage Cc.
Germany, 10 68 J. Knill & Co.
U. S, 150 710 Union Lighterage Co.
Germany, 25 298 L. Sutro & Co.
U. S., 40 240 R. G. Hall & Co.
" 50 350 Botolph & Nichl's Wvs. Co., Ld.
" 40 225 Page, Son & East
" 50 890 Howell & Co.
Germany, 10 80 Dutrulle, Solomon & Co.
" 10 50 Botolph & Nich's Wvs. Co., Ld.
" 33 264 Prop's Chamberlain's Wf.
France, 100 100 Rothbarth & Co.
" 100 100 Barrett, Tagant & Co.
Germany, 400 400 L. & I. D. Jt. Co.
" 600 600 Baxter & Hoare
" 100 200 J. Greig
" 100 100 Barrett, Tagant & Co.
U. S., 500 500 "
" 249 140 Union Lighterage Co., Ld.
" 500 500 T. C. Howell
" 500 500 A. Dawson
" 100 500 J. Keiller & Son
" 50 276 L. Sutro & Co.
Germany, 12 96 "
" 1,100 1,100 J. Barber & Co.
" 10 64 J. Knill & Co.
" 30 209 Baxter & Hoare

Gutta Percha—
Singapore, 425 c. Kaltenbach & Schmitz
" 215 J. H. & G. Scovell
" 7 L. & I. D. Jt. Co.
Batavia, 4 "

Isinglass—
Denmark, 1 pkg. W. M. Smith & Sons
N. Russia, 4 pks. J. Vickers
" 3 Magee, Taylor & Co.

Manure—
France, 30 t. Lawes Manure Co., Ld
U. S., 4 C. A. & H. Nichols
Germany, 270 F. J. Cornwall, Son & Co.
" 14 W. Pope & Co.
France, 290 Lawes Manure Co.
Phosphate Rock
U. S., 3,102 t. Wyllie & Gordon
Montreal, 225 A. Hunter & Co

Naphtha—
Holland, 27 drs. Stein Bros.
" 41 Burt, Boulton & Co.

Pearl Ashes—
Montreal, 80 c. Charles & Fox

Potassium Sulphate—
Germany, 63 pks. H. Lambert

Potassium Bicarbonate—
Holland, £70 A. & M. Zimmermann

Potassium Permanganate—
Holland, 10 pks. H. Boyce

Paraffin Wax—
U. S., 3,059 brls. J. H. Usmar & Co.
" 100 G. H. Frank
" 46 "
" 100 H. Hill & Sons
" 922 pks. "
" 100 brls. G. H. Frank

Plumbago—
Germany, 20 cs. T. H. Lee
" 2 cks. Brown & Elmslie
" 37 "
" 17 Prop. Scott's Wf.
" 10 cs. T. H. Lee
" 20 "
E. Indies, 388 brls. J. Thredder, Son & Co.

Sodium Hyposulphite—
Holland, £27 Beresford & Co.
" 55 J. James & Son

Saltpetre—
Germany, 50 kgs. P. Hecker & Co.
" 100 cks. T. Merry & Son
E. Indies, 23 L. & I. D. Jt. Co.

Stearine—
France, 2 cs. W. Poynter
" 10 sks. Van Geelkerken & Co.

Sodium Acetate—
U. S., 399 pks. Johnson & Hooper
Holland, 9 Soundy & Son
France, 50 Barr, Moering & Co.
" 9 Prop. Hay's Wf.

Tartaric Acid—
Holland, 11 pks. B. & F. W. Co., Ld.
" 20 Middleton & Co.
" 17 H. Grey, Junr.
" 10 B. & F. Wf. Co., Ld.

Turpentine—
U. S., 1,120 brls. Rose, Wilson & Co.

Tartars—
Italy, £500 Seager, White & Co.
" 850 Thames S. Tug Co.

Ultramarine—
Holland, 10 cs. Seaward Bros.
" 2 cks. Ohlenschlager Bros.
Germany, 20 G. Meyer & Co.
Belgium, 3 Leach & Co.

Zinc Oxide—
Germany, 50 brls. M. Ashby, Ld.
Holland, 25 "
" 30 Beresford & Co.

LIVERPOOL.

Week ending July 29th.

Acetic Acid—
Rotterdam, 30 bskts.

Albumen—
Trieste, 12 cs. R. Schlosser & Sons
Ghent, 10 J. T. Fletcher & Co.

Acetate of Lime—
New York, 1,540 bgs.

Bone Meal—
Bombay, 570 bgs. A. Vinayck, Chlutre, & Co.

Bones—
Para, 17 t. Gillies & Da Costa

Borax—
Leghorn, 12 cks.

Caoutchouc—
Sinoe, 1 brls. F. & A. Swanzy
" 1 C. Rottmann
Danoe, 7 F. & A. Swanzy
Addah, 2 J. P. Werner
Accra, 2 cks. Pickering & Berthoud
" 15 J. J. Fischer & Co.
" 2 Davies, Robbins & Co.
Axim, 1 bg. W. D. Woodin
" 8 Edwards Bros.
Grand Bassam, 1 brl. F. & A. Swanzy
" 2 bgs. W. D. Woodin
Salt Pond, 1 brl. A. Millerson
" 2 F. & A. Swanzy
" 1 W. D. Woodin
" 1 cs. W. Griffiths & Co.
" 3 3 Pickering & Berthoud
" 1 F. J. Eaton & Sons
" 7 Radcliffe & Dublin
" 3 R. Barbour & Bros.
" 1 D. Jones & Co.
" 2 cs. S. & C. Nordlinger
" 1 Havard & Co.
" 5 2 Edward Bros.
" 3 2 A. Miller Bros. & Co.
" 4
C. C. Castle, 3 5 Grimwade, Ridley, & Co.
" 3 Mordaunt Bros.
" 12 cks. Fletcher & Fraser
" 1 A. Brislaner & Co.
" 13 A. Miller, Bros. & Co.
" 1 cs. J. Smith
" 1 C. L. Clare & Co.
" 1 Havard & Co.
" 1 6 W. B. McIver & Co.
" 1 T. E. Tomlinson & Co.
" 1 W. Duff & Co.
" 3 Edwards Bros.
" 1 1 Challenor & Co.
" 2 Davies, Robbins & Co.
" 2 8 C. C. Allenor & Co.
" 3
" 1 H. B. W. Russell
Sierra Leone, 13 brls. Cie Francaise
" 5
Bathurst, 2 A. Cros & Co.
Manaos, 40 cs. J. Lilley & Sons
" 80
Para, 305

Charcoal—
St. Nazaire, 650 sks.

Cream of Tartar—
Bordeaux, 1 ck.
Patras, 6 brls.
Barcelona, 5 cks. Wright, Crossley, & Co.

Chemicals *(otherwise undescribed)*
Rouen, 43 cs. Co-op. W'sale Society Ltd.
Havre, 2

Dyestuffs—
Sumac
Palermo, 400 bgs.
Barcelona, 50
Gambier
Singapore, 841 bls.
Valonia
Constantinople, 183 bgs.
Myrabolams
Bombay, 320 bgs.
" 762 D. Sassoon & Co
Cutch
Bombay, 100 bxs.
Argols
Brindisi, 263 bgs.
Indigo
Corfu, 1 cs. D. A. Sevastopulo & Co.

Glucose—
New York, 68 brls.
" 120
Philadelphia, 60

Manganese Ore—
Gothenburg, 100 t.
Phosphate—
Antwerp, 215 t.
Montreal, 249 t Phospho Guano Co.
" 200
Ghent, 2,540 bgs. J. T. Fletcher & Co.
" 1,000
Pitch—
Rouen, 27 cks. Co-op. W'sale Society, Ltd.
Potash—
Montreal, 25 brls. J. Pyke & Son
" 10
Rouen, 9 cks. Co-op. W'sale Society, Ltd.
Phosphate Rock—
Montreal, 554 t. Phosphate Lime Co.
Pyrites—
Huelva, 1,769 t. Matheson & Co.
" 1,400 "
" 1,555 "
" 1,479 "
Sodium Acetate—
Rouen, 9 cks Co-op. W'sale Society, Ltd.
Saltpetre—
Hamburg, 10 kgs.
Sodium Silicate—
Rotterdam, 1 ck.
Tar—
Archangel, 1,321 brls.
Tartar—
Bordeaux, 37 cks.
Tartar Salts—
Rotterdam, 15 cks.
Tartaric Acid—
Rotterdam, 10 bgs.
Ultramarine—
Rotterdam, 4 cks.
Hamburg, 4 cs.
Verdigris—
Bordeaux, 4 cks.
Zinc Ashes—
Trieste, 4 brls. H. Chenery & Co.
New York, 149 bgs. R. Crook & Co.

TYNE.

Week ending July 30th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.
Copper Precipitate—
Huelva, 2,928 bgs. H. Schofield & Son
" 3,556
Glucose—
Hamburg, 12 cks. Tyne S. S. Co.
" 20 "
New York, 25 brls. Chr. Furness
Phosphate—
Antwerp, 310 t. Langdale's Chemical Manure Co.
Sulphur Ore—
Huelva, 310 t. 64 pks. Bede Metal Co.
Waste Salt—
Hamburg, 10 t. Tyne S. S. Co.
Zinc Oxide—
Antwerp, 13 brls. Tyne S. S. Co.

HULL.

Week ending July 31st.

Albumen—
St. Petersburg, 12 cs. Wilson Sons & Co.
Acids *(otherwise undescribed)*
Rotterdam, 20 pks. W. & C. L. Ringrose
" 2 cks. G. Lawson & Sons
Barytes—
Antwerp, 51 cks Bailey & Leetham
Bremen, 20 Blundell, Spence & Co.
" 63
Caoutchouc—
Hamburg, 1 cs. C. M. Lofthouse & Co.
" 1 Veltmann & Co.
Marseilles, 9 cs. Wilson Sons & Co.
Hamburg, 1 Veltmann & Co.
Chemicals *(otherwise undescribed)*
Genoa, 10 cks. Wilson Sons & Co.
Hamburg, 19 pks.
Rotterdam, 2 W. & C. L. Ringrose
Bari, 29 cks. Wilson Sons & Co.
Copenhagen, 4 "
Hamburg, 6 Bailey & Leetham
Bremen, 4 cks. 1 cs. Veltmann & Co.
Dyestuffs—
Logwood
New York, 50 bxs. Wilson Sons & Co.
Alizarine
Rotterdam, 7 cks. G. Lawson & Sons
" 53 pks. W. & C. L. Ringrose
" 50 cks. Hutchinson & Son
" 3 W. & C. L. Ringrose
" 49 pks. Hutchinson & Son
" 17 brls. 2 bxs. "
" 1 cs. 19 cks. W. & C. L. Ringrose
Rennett
Rotterdam, 4 cks. Hutchinson & Son
" 3
Valonia
Trieste, 220 bls. Wilson Sons & Co.
Myrabolams
Hamburg. 7 bgs. Kuypers, Ostler & Scott
Bombay, 1,322
Sumac
Palermo, 1,251 bgs. Wilson Sons & Co.
" 575
Madders
Rotterdam, 4 cks. Hutchinson & Son
Glucose—
Hamburg, 1 ck.
New York, 24 brls.
Hamburg, 11 cks. G. Lawson & Son
Stettin, 1,200 bgs. C. M. Lofthouse & Co.
" 12 cks.
" 56 Wilson Sons & Co.
Hamburg, 25 Bailey & Leetham
Magnesia—
Rotterdam, 50 cs. W. & C. L Ringrose
Oxide—
Rotterdam, 5 cs. Hutchinson & Son
Phosphate—
Ghent, 160 t. Wilson Sons & Co.
" 140 Hammond, Emes & Co.
Plumbago—
Trieste, 12 cks. Wilson Sons & Co.
Pitch—
Rotterdam, 34 cks. G Lawson & Sons
Potash—
Stettin, 14 cks. Wilson Sons & Co.
Sulphur—
Catania, 2,964 pks. Wilson Sons & Co.
Saltpetre—
Hamburg, 40 kgs.
Sulphur Ore—
Huelva, 1,402 t.
Soda—
Rotterdam, 7 cks. G. Lawson & Sons
Stearine—
Rotterdam, 2 bls. Hutchinson & Son
Ultramarine—
Rotterdam, 5 cs.
" 1 W. & C. L. Ringrose
Zinc Oxide—
Rotterdam, 25 cks.
" 13

GLASGOW.

Week ending July 31st.

Alum—
Rotterdam, 38 cks. J. Rankine & Son
" 4 "
Barytes—
Rotterdam, 48 cks. J. Rankine & Son
Dyestuffs—
Alizarine
Rotterdam, 56 cks.
Cutch
Boston, 10 brls.
Extracts
New York, 6 brls.
Antwerp, 2 cks.
Madders
Rotterdam, 1 ck. J. Rankine & Son
" 4 "
Glucose—
Stettin, 24 cks. 400 cs.
Phosphate—
Montreal, 100 t.
Paraffin Wax—
New York, 225 brls. 82 cs. Wm. Johnstone
Sulphur Ore—
Drontheim, 200 t.
Soda—
Rotterdam, 1 ck. J. Rankine & Son
Tartar—
Oporto, 6 cks. J. & P. Hutchinson
Turpentine—
Savannah, 2,360 c. Rowley & Dick

GRIMSBY.

Week ending July 26th.

Chemicals *(otherwise undescribed)*
Hamburg, 22 pks.
Glucose—
Hamburg, 20 pks. 12 cks.
Glycerine—
Rotterdam, 4 pks.

GOOLE.

Week ending July 23rd.

Antimony—
Boulogne, 4 cks.
Caoutchouc—
Boulogne, 4 cks.
Dyestuffs—
Alizarine
Rotterdam, 24 cks.
Logwood
Jamaica, 582 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 103 cks. 44 cs.
" 3 pks. 2 crbys.
Glycerine—
Rotterdam, 2 cs.
Glucose—
Hamburg, 200 bgs. 58 cks.
Plumbago—
Boulogne, 2 cs.
Potash—
Calais, 75 drums. 20 brls.
Dunkirk, 21 11
Sugar of Lead—
Hamburg, 20 brls.
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 22 cks.
Tartaric Acid—
Rotterdam, 10 cks.
Waste Salt—
Hamburg, 200 t.
" 350
Zinc Oxide—
Antwerp, 20 brls.

EXPORTS OF CHEMICAL PRODUCTS

OF

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending July 23rd.

Ammonium Sulphate—

Marseilles,	50 t.	18 c.	£650
Hamburg,	50	15	620
Demerara,	3	7	40
Shanghai,	5		60
Natal,	12	6	138

Arsenic—

Bombay,	6 cks.		£18
Hamburg,	9 t.	3 c.	140

Ammonium Carbonate—

Odessa,		15 c.	£25
Yokohama,	1 t.		38

Alum Cake—

Bordeaux,	11 t.		£40
Melbourne,	8	13 c.	25
Calcutta,	29	14	125

Bisulphate of Lime—

Bombay,	2 t.	2 c.	£30

Boracic Acid—

Boston,	10 cks.		£13

Copper Sulphate—

Galatz,		10 c.	£11
Treport,	21 t.	11	455
Odessa,	6	16	163
Antwerp,	5		88
Bordeaux,	20		433
Bombay,	5		120
Ghent,	1	2	27
Constantinople,	5	19	135
New York,	20		419
Adelaide,	7	10	155

Carbolic Acid—

Rotterdam,	30 tubes		£90
Mauritius,	4 t.	5 c.	142
Calcutta,	200 gls.		17
Hamburg,	5 t.	14 c.	103

Citric Acid—

New York,	2 t.		£265
Melbourne,		15 c.	119
Hamburg,		5	35
Melbourne,	4 cs.		26
Rotterdam,	1 ck.		35
Rangoon,	2 cs.		7

Caustic Soda—

Hong Kong,	16 t.	16 c.	£200
Melbourne,		19	59
"		10	15
Fremantle,	11	4	96
Hobart,	10	3	98

Cream of Tartar—

Brisbane,		5 c.	£24
Melbourne,		10	58
Fremantle,		3	16
"		6	33

Coal Products—

Carbolic Acid

Paris,	60 cs.		£100
New York,	20		75

Solvent Naptha

Treport,	25 cks.		£100

Green Oil

Stettin,	25 brls.		£12

Anthracene

Dusseldorf,	80 cks.		£519
Rotterdam,	65		275
"	65		428

Naphthaline

Hamburg,	73 cks.		£125
"	100 bgs.		65
Rotterdam,	134		68
"	53 cks.		33
Treport,	67 bgs.	6 cks.	45
Hamburg,		13	112

Benzole

Rotterdam,	96 drs.		£1,616

Tar

Stettin,	1,095 pks.		£520
Galatz,	50 rlts.		28
"	25 brls.		14
Danzig,	250		126
Portland,	99		127

Pitch

Constantinople,	150		£45
Odessa,	100 sks.		55
Galatz,	160 brls.		46
Antwerp,	177 t.		380
Gijon,	510		799
New York,	27 brls.		13

Chemicals *(otherwise undescribed)*

Melbourne,	1 ck.		£90
Auckland,	14 pks.		78
"	2		23
E. London,	5 cs.		31

Disinfectants—

Fremantle,	11 cs.		£40
Sydney,	10 cks.		29

Guano—

Kingston,	25 t.		£250
Demerara,		5 c.	66

Insect Powder—

Lisbon,		5 c.	£36

Manure—
Madras, 50 t. 18 c. £377
Gothenburg, 123 8 464
Riga, 560 11 1,687
Motril, 200 2,000
Riga, 145 5 401
" 222 700
Auckland, 100 475
Rochefort, 310 1,320
Hamburg, 200 1,000
Riga, 242 5 706
Bluff Hr. 50 675

Potassium Bitartrate—
Auckland, 2 pks. £52

Potassium Iodide—
Yokohama, 2 cs. £112

Phosphorus—
Las Palmas, 2 c. £17

Potassium Chlorate—
Sydney, 5 t. £200

Potassium Cyanide—
Shanghai, 13 c. £39

Potassium Nitrate—
Barbadoes, 19 t. 4 c. £337

Sulphur—
Berbice, 3 t. 4 c. £20

Sodium Nitrate—
Kobé, 9 t. 17 c. £90

Sulphur Flowers—
Madeira, 1 t. 4 c. £9

Salammoniac—
Galatz, 1 t. 10 c. £50
Varna, 15 25

Saltpetre—
Oporto, 6 t. 15 c. £137

Sheep Dip—
Natal, 300 drs. 100 cs. £344
" 475 12 164
Karachi, 11 20
Natal, 550 gls. 100

Sodium Bicarbonate—
Massawa, 4 t. 15 c. £41

Superphosphate—
Genoa, 50 t. £150
Libau, 600 1,800

Sodium Sulphate—
Ghent, 85 t. £85

Salts of Lime—
New York, 10 cks. £105

Soda Crystals—
Sydney, 15 t. £48
Newcastle, 25 64

Soda Ash—
Hobart, 10 t. 2 c. £59

Sodium—
Havre, 9 £152

Tartaric Acid—
Brisbane, 5 c. £32
B. Ayres, 2 t. 10 330
Melbourne, 1 77
Fremantle, 2 13
Bombay, 800 lbs. 54
Fremantle, 4 c. 29

Zinc Ashes—
Antwerp, 22 t. 5 c. £440

HULL.

Week ending July 29th.

Alum—
Danzig, 5 t.

Bleaching Powder—
Bergen, 11 cks.
Harlingen, 10

Caustic Soda—
Abo, 91 drms.
Gothenburg, 18
Helsingfors, 72
Konigsberg, 34
St. Petersburg, 100
Wyburg, 100 11 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 4 cs. 63 cks.
Abo, 44
Christiania, 5 8 pks.
Constantinople, 25
Copenhagen, 6
" 18
Danzig, 64 100
Drontheim, 34
Gothenburg, 22 15 5
Helsingfors, 19
Hamburg, 34 35
Konigsberg, 29 136
Libau, 4
New York, 11 100
Odessa, 98
Rotterdam, 20 32 16
St. Petersburg, 100
Stettin, 22 10

Dyestuffs *(otherwise undescribed)*
Christiania, 2 cks.
Hamburg, 3 drms.
Rotterdam, 3 1

Ferro Manganese—
Dahlsburk, 10 t.

Manure—
Danzig, 50 bgs.
Hamburg, 50 t.
Riga, 800 sks.
Stettin, 20

Naphtha—
Copenhagen, 10 cks.

Pitch—
Antwerp, 68 t.

Tar—
Gothenburg, 5 cks.
Hamburg, 17

GRIMSBY.

Week ending July 26th.

Chemicals *(otherwise undescribed)*
Dieppe, 118 pks.

LIVERPOOL.

Week ending July 26th.

Ammonium Muriate—
Philadelphia, 19 t. 8 c. 1 q. £461
New York, 6 t. 8 145

Ammonium Carbonate—
Genoa, 5 c. £8
Montreal, 1 t. 8 1 q. 47
Halifax, 6 2 11
Montreal, 1 3 1 20
Odessa, 1 32
Bombay, 1 11 1 38
New York, 13 5 420
B. Ayres, 19 2 34
Oporto, 5 8
Venice, 6 9
Barcelona, 7 9
Genoa, 10 16
Hamburg, 4 2 7
Genoa, 1 2 35
Rouen, 7 15

Ammonium Sulphate—
Demerara, 30 t. 7 c. 1 q. £359
New York, 30 6 2 873
Nantes, 25 2 254
Valencia, 49 6 1 574
Barcelona, 30 8 338
Las Palmas, 12 144
New York, 153 18 2 1,720
Philadelphia, 49 5 591

Ammonia—
New York, 2 t. 6 c. £49

Alum—
Constantinople, 6 t. £33
Ancona, 6 t. 1 c. 31
Auckland, 1 2 3 q. 6
Oporto, 2 1 17
Palermo, 4 2 1 22
Trebizonde, 3 15
Smyrna, 2 16 2 14
Beyrout, 2 10 1 13
Monte Video, 6 7 32
Colombo, 40 14 182
Piræus, 3 2 16
Montreal, 15 75
Stettin, 5 26
Calcutta, 5 25
Madras, 6 40

Bleaching Powder—
Boston, 84 tcs. 382 cks.
Calcutta, 100 cs.
Carthagena, 40 brls. 40
Chicago, 40 pks. 50
Galveston, 15
Montreal, 15
Oran, 40 kgs.
Philadelphia, 90
Piræus, 20
Santander, 6
Tarragona, 40
Bordeaux, 29
Palermo, 15
Barcelona, 10
Beyrout, 46
Bombay, 10 cs.
Bordeaux, 51
Boston, 222
Genoa, 293
Ghent, 44
Hamburg, 174
Montreal, 66

Bleaching Powder—*continued.*
New York, 228 cks.
Oporto, 14
Philadelphia, 110
Rio Janeiro, 15 cs.
Rouen, 55
Santander, 50 kgs.
Smyrna, 14

Borax—
Rotterdam, 1 t. 6 c. 1 q. £38
Oporto, 10 1 15
Seville, 2 1 1 57
Batoum, 18 3 26
Rotterdam, 1 28
Barcelona, 1 2 2 32
Odessa, 3 5 90

Brimstone—
Sydney, 51 t. 8 c. 2 q. £212
Brisbane, 25 105

Bone Waste—
Rouen, 6 t. 8 c. £35

Boracic Acid—
Rotterdam, 2 t. 2 c. £83
Bordeaux, 12 8 3 q. 72
Rotterdam, 1 28

Caustic Soda—
Nagasaki, 18 dms.
Nantes, 52
New York, 80 brls. 139
Oporto, 50
Palermo, 20
Paraiba, 20
Pasages, 110
Philadelphia, 135 30 cks.
Puerto Cabello, 12
Rio de Janeiro, 10
San Sebastian, 50
Santander, 20
Santos, 40
Seville, 220 brls. 231
Trieste, 3
Ibrail, 40
Algoa Bay, 15 cs.
Amsterdam, 24
Antwerp, 15
Bahia, 50
Batoum, 30
Brisbane, 20
Chicago, 50 pks. 50
Fairwater, 25
Ferrol, 6 brls.
Fiume, 30
Galatz, 80
Galveston, 30
Genoa, 96
" 30
Havana, 30
Lisbon, 15
Malaga, 65 12
Melbourne, 8
Mollendo, 1 cs.
Montreal, 50 22
Rotterdam, 36
Rouen, 34
St. Petersburg, 1,449
Santander, 26
Seville, 30
Talcahuano, 20
Trieste, 23
Vera Cruz, 32
Vigo, 2 12
Alexandria, 18
Algiers, 5
Amsterdam, 50
Antwerp, 29
Barcelona, 77
Batoum, 176
Boston, 451
Ceara, 10
Corunna, 20 brls.
Hamburg, 36
Malta, 3
Monte Video, 100
New York, 400
Odessa, 100
Oporto, 60
Passages, 15
Pernambuco, 13
Philadelphia, 60
Port Natal, 50 cs.
Porto Alegre, 20

Copper Sulphate—
Ancona, 10 t. 2 q. £201
Palermo, 2 1 40
Rotterdam, 10 1 c. 2 215
Leghorn, 15 5 303
Lisbon, 5 95
Suakin, 5 5
Naples, 15 2 15
Melbourne, 10 225
Talcahuano, 2 10 60
Santander, 10 220
Bordeaux, 10 1 1 206
Portland, 5 29

Copper Sulphate—*continued.*
Rio de Janeiro, 4 c.
Bordeaux, 30 2 647
" 15 1 1 300
Calcutta, 5 106
B. Ayres, 2 60
Antwerp, 2 11 51
Calcutta, 5 8 102
Bordeaux, 40 1 800
Hamburg, 4 19 96
Lisbon, 1 3 1 23
Oporto, 1 12 2 33
Genoa, 4 11 2 91
Naples, 3 11 71
Odessa, 6 5 2 132
Beyrout, 8 8
Hamburg, 15 8 1 899
Rouen, 42 8 1,060

Carbolic Acid—
Havre, 4 t. 11 c. 1 q. £364
Paris, 3 7 3 214
Rotterdam, 45 5,400
Bilbao, 1 5 3 98
Havre, 2 10 179
Santander, 1 2 2 12
Naples, 1 3 10
New York, 3 252
Barcelona, 9 3 45
Genoa, 1 17 1 131
Valparaiso, 1 1 7
Genoa, 1 8 110
Rouen, 11 40

Citric Acid—
Seville, 4 c. £28

Copperas—
Constantinople, 5 t. 12 c. 2 q. £10
Syra, 2 t. 15 1 5
Calcutta, 9 8 3 23

Caustic Potash—
Chicago, 1 t. 1 c. 3 q. £25

Copper Oxide—
Cartagena, 7 t. £350

Chalk Precipitate—
New York, 2 t. 2 c. 2 q. £34

Calcined Magnesia—
Genoa, 42 lbs. £50

Charcoal—
Nantes, 90 t. 17 c. 1 q £453

Disinfectants—
Montreal, 3 c. £9

Epsom Salts—
Calcutta, 110 brls.

Gypsum—
New York, 10 t. £30

Ground Spar—
Havre, 108 t. 10 c. £820

Iodine—
Hamburg, 5 t. £3,000

Iron Oxide—
Talcahuano, 20 brls. £10

Magnesium Chlorate—
Bombay, 10 t. 3 c. £27
Boston, 2 13 7
Bombay, 5 3 3 q. 15

Manure—
Hamburg, 55 t. £350
Havana, 9 54
Bordeaux, 35 2 c. 1 q. 220
St. Nazaire, 365 17 1 1,811

Oxalic Acid—
New York, 5 t. 2 c. £68

Pitch—
New York, 10 cs.
San Sebastian, 40 brls.

Phosphorus—
B. Ayres, 1 t. 12 c. £165
Kingston, 2 q. 16
Havana, 6 86

Potassium Chlorate—
Cape Town, 1 t. 5 c. £64
Kingston, 1 39
Monte Video, 5 256
Vera Cruz, 2 5
New York, 5 11 289
Hiogo, 5 238
Manila, 1 9
Corunna, 10 23
Odessa, 1 10 70
Oporto, 13 32
Palermo, 10 25
Gothenburg, 5 222
St. Petersburg, 6 10 280
San Francisco, 1 5 60
Stettin, 2 10 130
Trieste, 10 25
St. Petersburg, 2 10 198
Hong Kong, 5 260
Callao, 5 13
St. Petersburg, 5 210
Oporto, 5 12
Hamburg, 2 3 98

Potassium Bichromate—
Rio de Janeiro, 1 t. 4 c. 2 q. £45

Potassium Prussiate—
Pasages, 4 c. £17
Seville, 4 19
Valencia, 5 1 q. 15
Rio de Janeiro, 10 44

Potashes—
Antwerp, 12 c. 2 q. £12
Rosario, 8 3 13
Amsterdam, 17 3 20

Sodium Chlorate—
Philadelphia, 1 t. £56
Antwerp, 1 55
Hamburg, 1 55

Salammoniac—
Calcutta, 5 t. 15 c. 3 q. £190
Constantinople, 3 6
Philadelphia, 7 12 266
Alexandria, 1 4 43
Genoa, 1 1 3 35
Ghent, 19 2 34
Larnace, 4 2 8

Soda Ash—
Alicante, 26 cks.
Baltimore, 368 80 tcs.
Brisbane, 33
Calcutta, 140 kgs.
Chicago, 34
Christchurch, 5 brls.
Corfu, 50
Ghent, 51
Hamilton, 39
Kobe, 115
Leghorn, 38
Napier, 23
New York, 46
Odessa, 150
Philadelphia, 136
Rio de Janeiro, 64
Smyrna, 50
Toronto, 35
Bahia, 10
Baltimore, 68
Barcelona, 150
Boston, 249 1,400 bgs.
B. Ayres, 218
Havana, 2
Malaga, 8 10 kgs.
Monte Video, 50 brls.
Montreal, 17
Naples, 6
New York, 144
Philadelphia, 766 130
Rio Grande du Sol, 50
Rio de Janeiro, 270
San Francisco, 132
Santos, 5
Seville, 2
Sydney, 52
Valencia, 55

Sodium Bicarbonate—
Amsterdam, 20 cks.
Barcelona, 80
B. Ayres, 72
Callao, 28 pks.
Constantinople, 50 kgs.
Dantzic, 20
Genoa, 40
Hamilton, 9
Hamburg, 200
Monte Video, 5
Nantes, 20
Naples, 120
Palermo, 16 50 5 brls.
Rouen, 100
St. Petersburg, 500
Seville, 20 2
Singapore, 4
Sydney, 100
Vera Cruz, 12
Brisbane, 50
Algiers, 30
Amsterdam, 20
Antwerp, 100
Auckland, 44
Bombay, 700
Bordeaux, 60
Carthagena, 80 25 brls.
Constantinople, 20
Dunedin, 100
Fiume, 40
Halifax, 100
Hamburg, 93
Madras, 150
Marseilles, 75
Montreal, 50 4 cs.
Naples, 15
Newcastle, 100
Odessa, 420
Oran, 10 brls.
Palermo, 50
Piræus, 20

Sodium Bicarbonate— *continued*
Rotterdam, 45
St. Johns, Nfld., 20
Santander, 30
Seville, 120 15
Sydney, 300
Trieste, 20
Wellington, 56

Soda Crystals—
Baltimore, 250 cks.
Barbadoes, 1
Boston, 492
Constantinople, 7 brls.
Madras, 33
Monte Video, 67
Montreal, 375
New York, 150
Pernambuco, 200
Philadelphia, 231 374 kgs. 170
Gibraltar, 10
Montreal, 25
Philadelphia, 440
Soura bayo, 14

Salt—
Accra, 5 t.
Algoa Bay, 8
Antwerp, 100
Barbadoes, 25
Belize, 10
Boston, 100
Calcutta, 3,945
Callao, 64 6 c.
Cape Palmas, 10
Chicago, 230
Chittagong, 4,290
Montreal, 709
Newcastle, 10
New Orleans, 100
New York, 1,210
Opobo, 72 6
Orebak, 110
Trinidad, 47 17
Para, 213 10
Port Natal, 50 10
Wyborg, 2,029
Puerto Cortez, 22 6
Quebec, 500
Rangoon, 25
San Francisco, 150
Richibucto, 100
Rotterdam, 323
Sydney, 358 13
Trangesund, 600
Akassa, 400
Antwerp, 100
Dordricht, 250
Ghent, 275
Montreal, 722
Newfahrwasser, 1,097
Para, 300 4

Sodium Silicate—
Oporto, 12 brls.

Sheep Dip—
Natal, 2 t. 12 c. £150
Valparaiso, 14 28
Algoa Bay, 1 10 80
Cape Town, 2 14 140

Sulphur—
Montreal, 2 t. 3 c. £28
Boston, 5 217
Pernambuco, 1 2 3 q. 8
Boston, 50 2 225
Singapore, 2 15 3 19
Boston, 50 2 225
Pernambuco, 12 5
Boston, 170 5 766
Rouen, 10 45

Saltpetre—
Gr. Canary, 1 t. 10 c. 3 q. £29
Havana, 8 3 10
Piræus, 7 10 162
Pernambuco, 3 12 1 96

Sodium Nitrate—
Barbadoes, 1 t. £9

Sodium Biborate—
New York, 7 c. £19

Tar—
Genoa, 3 cks.
Lima, 20 brls.

Tin Oxymuriate—
Rio de Janeiro, 2 c. 2 q. £8

Zinc Chlorate—
Boston, 3 t. 2 c. 1 q. £26
Bombay, 2 16 1 50

GLASGOW.

Week ending July 31st.

Ammonium Sulphate—
New York, 50 t. 17½ c. £563
Halifax, 61 9¾ 659

Acetate of Lime—
Antwerp, 10 t. 13¾ c. £228

Albumen—
Lisbon, 6¼ c. £30

Charcoal—
Antwerp, 4 t. 15 c. £37

Chemicals *(otherwise undescribed)*
Karachi, £27

Dyestuffs—
Extracts
New York, 3 t. 13 c. £82
Montreal, 26

Iodine—
Philadelphia, 57¾ c. £3,380

Litharge—
Karachi, 1 t. 18¾ c. £28. 16s.
Montreal, £150

Manganese Oxide—
New York, 203½ c. £95

Manure—
Batavia, 100 t. 3½ c. £1,008
Mauritius, 21 7 c. 166

Naphtha—
Rouen, £200

Nitric Acid—
Bombay, 5 t. 7 c. 16 lbs. £175

Potassium Bichromate—
Karachi, 3 t. 18½ c. £122
Rouen, 14¾ 25
Bordeaux, 5 14 200
Quebec, 145
" 7 2 225
Lisbon, 22½ 38
Smyrna, 21¾ 36
Odessa, 66¾ 108
Antwerp, 100 117
" 5 6 190

Paraffin Wax—
Rouen, 5 t. 15¼ c. £159
Lisbon, 43½ 50
Smyrna, 21¾ 40
Bordeaux, 2 11 65
Antwerp, 5 1 150

Potassium Prussiate—
New York, 109¾ c. £362
Rouen, 5 t. 7½ 290

Sodium Bichromate—
Karachi, 2 t. 6¾ c. £51
Rouen, 199¾ 237
Antwerp, 5 12¾ 140

Soda Ash—
New York, 175½ c. £50

Tar—
Batavia, 48 t. £100
Rangoon, 45 200

TYNE.

Week ending July 30th.

Aluminium—
St. Petersburg, 1 cs.

Alum Cake—
New York, 50 t. 15 c.

Alkali—
Amsterdam, 9 t. 12 c.
" 30 15
Venice, 6 4
Hamburg, 5 2
Genoa, 2 14
Gothenburg, 10 10
Riga, 6 5

Arsenic—
Venice, 5 t. 4 c.
St. Petersburg, 5 3

Bleaching Powder—
St. Petersburg, 50 t. 7 c.
" 80 1
Gothenburg, 1 11
" 5 2
Christiania, 2 8
Antwerp, 4 19
Hamburg, 20 2
Genoa, 33 9
Horsens, 1 1
Lisbon, 11 5
New York, 60 11
Copenhagen, 5 16
San Francisco, 93 8
Riga, 25 2
St. Petersburg, 193 6
" 100 2
Amsterdam, 16 8
" 27 4
Venice, 21 6
Rotterdam, 7 7
" 10 1
" 13 6
Venice, 2 3

Barium Chloride—
Genoa, 1 t. 1 c.

Baryta Nitrate—
Hamburg, 18 c.
Genoa, 19

Barytes Sulphate—
Genoa, 9 t. 17 c.

Barytes Carbonate—
Rotterdam, 5 t.

Calcined Magnesia—
Genoa, 4 c.

Copperas—
Lisbon, 5 t. 2 c.
Rotterdam, 10 7

Caustic Soda—
Antwerp, 33 t. 9 c.
" 100 2
Christiania, 5 4
New York, 9 7
St. Petersburg, 33 7
San Francisco, 72 10
Copenhagen, 1 16

Charcoal—
Copenhagen, 1 c.

Gypsum—
New York, 77 t. 10 c.

Litharge—
Copenhagen, 5 c.
Gothenburg, 2 t. 1
Hamburg, 1 12
Rotterdam, 2

Magnesia—
Hamburg, 5 c.
Venice, 2
" 5

Magnesium Carbonate—
New York, 4 t. 9 c.
St. Petersburg, 1 5

Pitch—
New York, 241 t. 8 c.

Potassium Chlorate—
Hamburg, 5 t. 11 c.
St. Petersburg, 15

Potassium Bichromate—
Rotterdam, 1 t. 1 c.

Soda—
Amsterdam, 30 t. 14 c.
Rotterdam, 11 17
" 15
Svendborg, 16 17
Randers, 30 13
Uleaborg, 2 13
Esjberg, 11 18
Odense, 28 4
New York, 100

Soda Ash—
Antwerp, 1 t. 7 c.
" 5 4
Hamburg, 5 1
Venice, 5 1
Christiania, 2 10
" 4 18
Gothenburg, 15 19
Odense, 14 11
Lisbon, 15 4
Riga, 10 3

Superphosphate—
Bandholm, 83 t. 19 c.
Riga, 850 8
Reval, 350

Sodium Sulphate—
Christiania, 13 t. 11 c.
Gothenburg, 25 18

Sodium Hyposulphite—
St. Petersburg, 4 t. 19 c.

Sodium Silicate—
Genoa, 2 t. 16 c.

Sodium Chlorate—
Hamburg, 6 c.

Sulphur—
Gothenburg, 1 t. 6 c.

GOOLE.

Week ending July 23rd.

Alkali—
Ghent, 15 drs.

Benzole—
Hamburg, 31 drs.

Bleaching Preparations—
Hamburg, 84 cks.
Rotterdam, 28

Coal Products—
Rotterdam, 23 cks.

Chemicals *(otherwise undescribed)*
Ghent, 1 ck.

Dyestuffs *(otherwise undescribed)*
Ghent, 2 drms.
Boulogne, 2 2 cks. 1 cs.
Hamburg, 115
Rouen, 4

Manure—
Boulogne, 44 bgs.
Hamburg, 475

Pitch—
Boulogne, 85 bgs.

PRICES CURRENT.

WEDNESDAY, August 6, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	64/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¼
Muriatic (Tower Salts), 30° Tw. .. .. ..per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	1	0½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2½
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	10	0
,, ,, (grey), Hull .. .. ,,	11	10	0
Aniline Oil (pure) .. .. per lb.	0	0	10¾
Aniline Salt ,, ... ,,	0	0	9½
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	5	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	2	6
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	4	0
,, 50/90 ,, ... ,,	0	3	0
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7¼
,, (crude 60°) .. .. per gallon	0	2	0
Creosote (ordinary) .. .. ,,	0	0	2½
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	5	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	57	10	0
,, Sulphate .. .. ,,	18	10	0
,, Oxide (copper scales) .. .. ,,	52	10	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	2	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	1½
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¼
,, Carbonate, 90% (ex ship) .. .. .. per ton	19	15	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	22	15	0
,, ,, (Caustic Potash) 75/80 % .. ,,	21	15	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	0	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	2¾
,, Nitrate .. .. ,,	0	2	8
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	2	6
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	5	0
,, ,, (Soda Crystals) .. .. ,,	2	17	6
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	10	15	0
,, ,, (74 % Caustic Soda) ,, ... ,,	10	10	0
,, ,, (70 % Caustic Soda) ,, ... ,,	9	17	6
,, ,, (60 % Caustic Soda, white) .. ,,	9	0	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	8	15	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	3
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8
,, Barium, 95 % .. .. ,,	0	0	5½
,, Potassium .. .. ,,	0	0	8¼
Sulphur (Flowers) .. .. per ton.	8	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	98	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	0	0

THE

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LATE ADVERTISEMENT.

TO TAR DISTILLERS AND OTHERS.

THE Directors of the Gloucester Gas-light Company invite TENDERS for the SURPLUS TAR produced at their works for one, two, or three years, from the 1st day of October next.

The Tar will be delivered into Boats or Barges at the Company's Wharf, on the Gloucester and Berkeley Canal.

Offers to be at per ton of 200 gallons.

Payments cash monthly.

Further particulars may be obtained on application to Mr. R. Morland, the Company's Engineer.

Sealed tenders, endorsed "Tender for Tar," and addressed to the Chairman, Gas Offices, Quay, Gloucester, to be delivered not later than Tuesday, the 26th day of August inst.

The Directors do not bind themselves to accept the highest or any tender.

By order,
WILLIAM E. VINSON, Secretary.

Gas Offices, Gloucester, August 7, 1890.

Notices.

All communications for the *Chemical Trade Journal* should be addressed, and Cheques and Post Office Orders made payable to—

DAVIS BROS., 32, Blackfriars Street, MANCHESTER.

Our Registered Telegraphic Address is—

"Expert, Manchester."

The Terms of Subscription, commencing at any date, to the *Chemical Trade Journal*,—payable in advance,—including postage to any part of the world, are as follow :—

Yearly (52 numbers) ..... **12s. 6d.**
Half-Yearly (26 numbers) ..... **6s. 6d.**
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Readers will oblige by making their remittances for subscriptions by Postal or Post Office Order, crossed.

We shall esteem it a favour if any of our readers, in making inquiries of, or opening accounts with advertisers in this paper, will kindly mention the *Chemical Trade Journal* as the source of their information.

Advertisements intended for insertion in the current week's issue, should reach the office by **Wednesday morning** at the latest.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates :—

30 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

Advertisements of Situations Wanted are inserted at one-half the above rates when prepaid, viz :—

30 Words and under ..... 1s. 0d per insertion.
Each additional 10 words ..... 0s. 3d. per insertion.

Trade Advertisements, Announcements in the Directory Columns, and all Advertisements not prepaid, are charged at the Tariff rates, which will be forwarded on application.

THE OLD WINE AND THE NEW.

IN another part of the present issue we publish a remarkable circular which appeared in the *Times* last week. Messrs. Delvendahl and Kuentzel, of Berlin, propose to accommodate British and other wine and spirit merchants with every article used in their trade except water, bottles, barrels, and corks. It is just possible that we ought also to say except *wine* also, for it appears to us that the concoctions which this enterprising German firm would tempt its customers to make, would stand a very good chance of not being adulterated with anything so objectionable. The old expression, "drunk with new wine," will require an entirely new significance under the fierce light shed by this circular, for now with these essences, flavours, and vegetable powders, what can we not do?

Infuse the essence into its hundred gallons of water, and when we have duly painted it, seasoned it with sugar, flavoured it with some innocent flavouring from the same unsophisticated source, we can add a little lime or agar-agar, or terra di vino (we had almost said terror divineo) and Lo! we have all the clearness, the brilliancy, the bouquet, that any ordinary taste could desire. Who would lay down a wine for seventy years or so to become old and crusted? We say any ordinary taste advisedly, for it surely would only be an extraordinary taste that could not be tempted from its natural course by such artistic combinations as these. He will be a bold one indeed who can now say a man is "*in vino veritas*," for, so far as these wines are concerned at any rate, the teetotal or non-alcoholic section of the community should have little of which to complain.

In another column we publish some particulars on another side of this question—the subject of "Whiskey from Jute," which opens up in connection with this triumph of Teutonic Synthetical Chemistry, a vista of possibilities, which is a caution to the unprotected vision. Imagine for a moment whiskey, or call the thing what you will, made by these refined but misdirected subtleties of modern chemistry, flavoured with the productions of Herren the German firm at Berlin. Who can answer for it that a great increase in our criminal statistics will not result? It has been often said that alcohol is a poison, but the world, or a large portion of it has been imbibing its beer, its wine, its usquebaugh for generations, yet it is only within comparatively recent times that the drunkard's fit has so generally assumed the murderous aspects of a demoniacal frenzy. How much of this is to be credited to the scientific productions of firms who make "silent spirit," "*Wiskey de Jute*," and the various queerly defined, if separate, essences, flavours, and colourings, whereby they are adapted to deceive the three senses of man which are most commonly concerned in their detection. Special Brands, indeed! we shall have nothing else in a little while. Even gum and paste have been assailed by these enterprising practitioners, for we are told in clause 6, that gummitine is a new substitute for ordinary gum for sticking labels on the glass bottles. We shall have a substitute, a

counterfeit presentment, of the glass itself next. Our contemporary naïvely suggests that the German firm who issued the circular, would probably prefer for their own drinking, the natural fruits of a Spanish or Portuguese vineyard, to any combination of their own choice essences and colouring powders.

We should like to know whether the people who send sophisticated articles, or articles intended for sophistication, onto the markets of the country, would object to be paid in sophisticated money, to receive, say, a coin as a sovereign which had the outward semblance of a sovereign without being one, or a cheque, or bank note, purporting to be genuine, yet not being genuine. What would be the fate of the person who knowingly presented such in payment, and why should not a similar fate await the evil doer on the other side?

Another expression in this circular attracts our attention, it is, "so much" "per lb. *free house*, London." Now "free house, London," can only mean free Custom House, London, or free Somerset House, London, we incline to think it means the former, but we are decidedly of opinion that it should concern both.

If the unfortunate purveyer of an article, say spirits of nitre, which, owing to being too long in stock, is not of the nature and substance of that article, he is immediately dragged before the magistrates, and if they deem it necessary, Somerset House is called in to decide. Why should not Somerset House be called in by the Customs, to prevent the introduction into this country of substances palpably intended for purposes of sophistication?

It is not unreasonable to suppose that people are to be found, who, having received this circular, would fall victims to its allurements, instead of doing as Mr. Frank Halford has done, in boldly publishing the circular in its naked frankness. In conclusion, we would say that in all this substitution of nature by art, there is one "rift in the lute," *vide* clause 7, wherein the circulators confess to being dependent upon the annual chances of cherry trees, raspberry canes, currant bushes, etc., but, as we read it, only for the brief period when these are in season. It is a matter of great importance to that portion of the chemical trade which is especially concerned with alcohols, ethers, etc., and we commend the circular to the consideration of our analytical friends, who, no doubt, will keep a watchful eye upon matters germane thereto.

CHEMICAL ENGINEERING.*

XXVIII.

WEIGHING AND MEASURING.

THE varying weights of a unit bulk of material, whether that material be solid, liquid, or gaseous, is a matter that deserves the careful attention of the experimentalist. The method of ascertaining specific gravities has already been alluded to in a previous chapter, and need not further be treated upon, as it is a subject gone into very fully in works on physical manipulation, yet it is not a subject that can be overlooked by the chemical engineer.

In dealing with liquids or gases, the weight upon beams and girders, and the storage room required will be indicated directly by the specific gravity, because there are no interstitial spaces. With solids, on the contrary, the specific gravity is only a vague guide, and for all manufacturing purposes the chemical engineer should ascertain the storage capacity of the materials with which he principally deals, by weighing the quantity that can be loosely packed into a box of known capacity, say, a cubic foot for English weights and measures, and a cubic metre for the metric system. The larger the quantity taken, the more accurate will be the computation. In this way it has been found that storage space can be very accurately provided and stocks properly estimated without difficulty. The following table gives the weight, in pounds avoirdupois, of a cubic foot of each of the substances:—

Substance.	Pounds.	Substance.	Pounds.
Black Ash	60	Pyrites	156
Burned pyrites ..	95	Quicklime	62
Clay.....	103	Salt.....	43
Coke	30	Salt cake	73
Flints	100	Sieved lime	34
Limestone	87	Alkali waste	80

If a little care were taken in these matters, quantities would more often be rendered in terms that could be generally understood. For statistical purposes, numbers that cannot be generally compared are useless; the terms one hundredweight of lime, or a ton of lime would be understood by everyone, but how many would realise the weight of this ingredient on being told that "three yards of lime were required to soften a million gallons of water?" Yet this is one method of indicating the quantity employed in certain operations.

I have very little to say upon the subject of weighing solids, the means at hand for this operation are too well known to require description, and in a factory, generally, resolve themselves into some form or other of the platform weighing machine. These weighing machines are elaborated steelyards, and, if kept in order, are very accurate in their indications; but if allowed to get out of repair, they have many times led to serious error. The task of weighing out solids for use in a large factory is no small matter, and it behoves all engaged in designing new works to so dispose the arrangements of this department as to ensure the work being done in the easiest manner possible, with a minimum of trouble and labour; as sooner or later, according to the amount of trouble involved, the work will be found to be done in a very perfunctory manner, weight gives way to barrowfulls and shovelfulls, and all correct record is soon lost.

In many operations where charges of definite weight are required at frequent intervals, a hopper weighing machine is employed, the material runs into the containing box, the supply being cut off so soon as the given weight has entered. Messrs. Avery and Co., of Birmingham, exhibited some very ingenious machines of this pattern at the Manchester Jubilee Exhibition. The old fashioned beam-scales are not much used now, still there are operations where they are specified to be employed, such as the sale of copper precipitate, and they are also employed to advantage in all chemical operations dealing with high priced material, and where the bulk is small.

For stock taking purposes, a few simple rules for the mensuration of solids may not be out of place here. A heap of pyrites, for instance, may perchance be taken as a pyramid, or even as a cone, in either case, multiply the area of the base by one-third of the height and the product will be the solidity. A long heap can be calculated as a wedge if the top or apex be pointed, in which case, add the three parallel edges together and multiply one-third of the sum by the area of that section of the wedge which is perpendicular to these three edges, and the product will give the contents.

The cubic capacity of many chemical vessels can easily be arrived at, by application of the simplest rules of mensuration. For hemispheres multiply the cube of the diameter by 0·5236 and divide by two, which will give the contents. A simple rule for the segments of spheres may serve for such vessels as crystallizers; in this case, to three times the square of the radius of the segment's base, add the square of its height, multiply this sum by the height, and the product by 0·5236, which will give the contents required.

*A course of lectures delivered by Mr. George E. Davis, at the Manchester Technical School.—*All rights reserved.*

In the construction of plant, the extent of surface is quite as often required as cubic capacity, simple rules may here be useful. To find the surface of a globe or sphere, multiply the diameter by its circumference and the product will be its convex surface. To find the convex surface of any segment or zone of a sphere, multiply the circumference of the whole sphere by the height of the segment or zone, and the product will be the convex surface.

To find the weight of an iron sphere from its diameter, divide nine times the cube of the diameter (in inches) by 64, which will express the required weight in pounds. To determine the diameter of an iron sphere of known weight (such as for counterbalance weights, &c.) multiply the weight by 7·112, then take the cube root of the product for the diameter.

Turning now to the measuring of liquids in motion, as distinguished from their measurement in a state of rest, we have, perhaps, one of the most important problems that the chemical engineer has to encounter. Unfortunately, though water can be measured with very fair accuracy by means of a "meter," yet most chemical liquids and meters do not agree in contact, either the meter is rusted, or else corroded, or furred up with the majority of liquids requiring to be measured. A steady and well regulated flow of liquid can, however, be maintained by means of an ordinary tap or valve connected with a cistern so arranged as to give a constant head, this may be done by means of a regulating valve and float shown in the accompanying illustration.

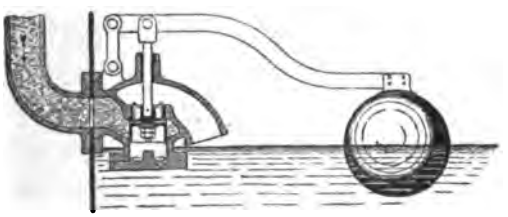


Fig. 1.

The main store-tank is connected with the regulating valve on the inlet side, so that the regulating tank is always full to a constant level; under these conditions, the outflow tap, when once regulated, will deliver a constant volume. Of course, the tank, valve, and float will have to be constructed of suitable materials. An application of the principle of Marriotte's bottle can be made in many operations, but the difficulty of replenishing the contents, puts it out of court in all but small experiments.

In some cases it is not so necessary to have a constant or well regulated supply, as to know what volume is passing at the moment. A flow of this kind can best be measured by its passage through a carefully prepared orifice, and as this method is likely to be of great use in many operations, I will give the details of construction of an appliance to measure from 400 gallons to 1,400 gallons per hour.

A cast iron open top box of half-inch metal should be constructed as shown in the figures 2 and 3, about 20 inches deep and 15 inches wide, the midfeather runs to within an an inch of the bottom and forms two chambers, one 6 inches and the other 12 inches long. The liquid it is desired to measure is admitted into the larger chamber of the two, marked "inlet chamber."

The liquid flows underneath the midfeather into the outlet chamber, where it finds an exit at the orifice specially provided. For this purpose, an aperture, 2½ inches square, is cast in the box, in front of which is fixed a brass plate (fig. 4) pierced with a carefully regulated aperture, and filed away to form knife edges. An orifice of one inch square will serve for measuring quantities varying from 400 to 900 gallons per hour, while an orifice 1¼ × 1½ inches, is suitable for volumes from 800 gallons to 1,400 gallons per hour. A glass water-gauge stands outside the box as shown, behind

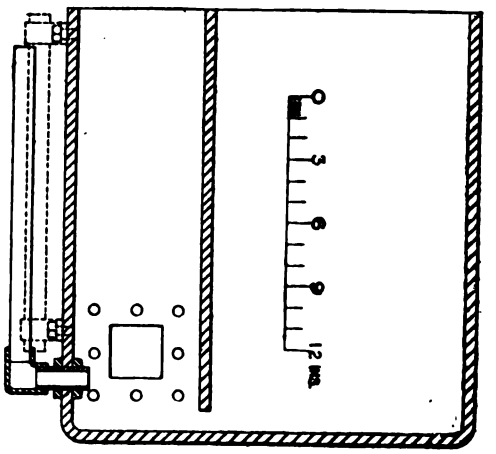


Fig. 2.

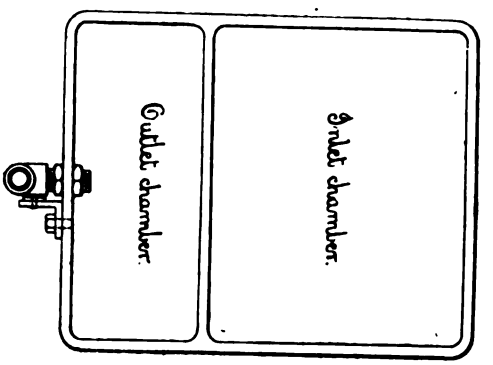


Fig. 3.

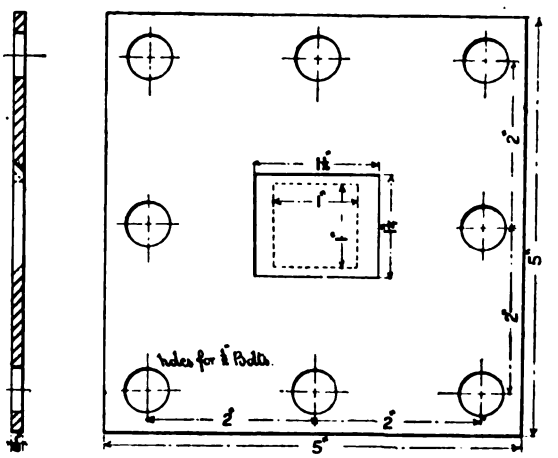


Fig. 4.

which is placed a graduated scale marked to show gallons of flow. The heights to which the scale should be marked, measured from the *centre* of the orifice, is shown in the following table:—

1" ORIFICE.		1¼" × 1½" ORIFICE.	
Gallons.	Inches.	Gallons.	Inches.
400	3·02	800	3·68
450	3·83	850	4·16
500	4·72	900	4·66
550	5·72	950	5·13
600	6·82	1000	5·75
650	8·00	1050	6·32
700	9·27	1100	6·95
750	10·60	1150	7·61
800	12·10	1200	8·28
850	13·71	1250	8·98
900	15·30	1300	9·72
		1350	10·45
		1400	11·25

It is easy to see that by enlarging the orifice, or increasing the depth of the vessel, the measuring box may be employed for larger quantities than herein indicated, and a measure of this kind will prove a very useful appliance in an experimental works. If the orifice be made circular, turned true in the lathe for instance, the following formula will enable any volume to be measured :—

$$G = \sqrt{H} \times d^2 \times 10.$$

$$H = \left(\frac{G}{d^2 \times 10}\right)^2$$

$$d = \left(\frac{G}{\sqrt{H} \times 10}\right)^{\frac{1}{2}}$$

Where G= the number of gallons discharged per minute, H = the head of water in feet, *d* being the diameter of the orifice in inches.

(To be continued.)

A REMARKABLE CIRCULAR.

THE following circular was published in the *Times* of August 6 :—

"TO DISTILLERS AND THE WHOLESALE WINE TRADE.

"From Messrs. Delvendahl and Kuentzel, Berlin and Malmo, essences, essential oils, colours, &c , manufacturers, and distillers.

"21, Ritterstrasse, Berlin, S., July, 1890.

"Dear Sirs,—We take leave to draw your attention to some of our specialities concerning your trade and should consider it a great favour if you will give same a trial when an opportunity offers.

"We manufacture :—

"1. Essences for the spirit trade especially—Cognac essence (about 4lb. of essence for 100 gallons of spirit 10 under proof). Price 7s. per lb., free house, London, duty paid. Rum essence (about 4lb. of essence for 100 gallons of spirit 12 over proof). Price 6s. 6d. per lb., free house, London, duty paid. Gin essence, price 6s. 6d. per lb., free house, London, duty paid. We have been repeatedly highly complimented by the trade for producing such fine essences, and we venture to say that there are not similar essences in the market, that can compare with same.

"2. Every description of wine flavours, especially :—Port wine essence, at 3s. 9d. per lb., free house, London, duty paid. Sherry essence, at 3s. 6d. per lb., free house, London, duty paid, &c.

"3. Vegetable colours, in powder, guaranteed harmless for every purpose, we only mention :—Port wine colour at 3s. per lb., free house, London. Red wine colour at 2s. 9d. per lb., free house, London. Cognaccine colour at 20s. per lb , free house, London, a beautiful and rich colour for colouring brandies and spirits generally ; its use will be found far more advantageous than adopting sugar colouring. Rum colour, for rum our R. E. colour will be found the most suitable. Price 20s. per lb., free house, London. It is equally rich, about eight drachms are sufficient for colouring one gallon of fluid.

"4. Every kind of preparation, &c., for the clearing of dark and light wines, as clearing powders, gelatine, agar-agar, gelatine lime, terra di vino, &c.

"5. Every description of sugar colourings in casks of about 6 cwt. or 7 cwt., as : Rum colouring (in 40 o.p.), spirit colouring (in 58 o.p.), and wine colouring, 4s. 6d. to 7s. per gallon, free house, London.

"6. Gummitine.—A new article, being a substitute for the ordinary gum, especially suitable and highly recommended for sticking labels on glass, tins, etc. Price 1s. 6d. per lb.

"7. We take this opportunity to bring to your notice our fruit juices, which we press on the premises, using only picked fruit for this purpose, as raspberry, blackberry, strawberry, red currant, cherry juice, &c.

"When in season, we supply these juices soon after pressing, and without any addition of spirit, and we shall be pleased to submit to you on application, a sample of any of them when ready. An early application is solicited.

"We specially draw your attention to our pure cherry juice. We press this juice from a specially selected sort of cherries. From the continually increasing demand of late years from England, we may consider that our juice has given general satisfaction. It has been found the simplest, best, and most advantageous means to prepare cherry brandy. This season's cherry crop does not promise to be a very abundant one, and we are, as yet, unable to give an idea of the price of the new juice, which may hardly be expected to be ready before the end of the current month.

"We shall be very glad to send you samples and quotations of any of our articles which may interest you, free of charge. We feel certain that a fair trial of our samples will convince you of the correctness of what we claim for our specialities.

"We are, dear Sirs, yours respectfully,

"DELVENDAHL AND KUENTZEL."

ORGANIC SYNTHESIS.*

BY S. G. JENKS.

THE history of chemistry might be styled "A Comedy of Errors," for not only have there been errors, but errors of such a kind as to constitute a true comedy. An error is not such a bad thing, however, as it is sometimes thought to be, for sooner or later someone finds it out and states the truth. Then follows a conflict between truth and error, in which truth is victorious. Thus truth is not only established, but emphasized.

The first error that affected the development of organic chemistry in a noticeable way was the search for the "philosopher's stone." At present we see the inorganic branch of the science far more fully developed than the organic, but this is not due to the greater age of the former. The ancients, naturally enough, I think, became acquainted with organic bodies first. They used acetic acid in the form of vinegar very early, while probably the earliest artificially prepared salts were the acetates of the alkalies. They were also acquainted with various gums, resins, oils, and sugar, and made wine from grapes, and beer from malted grain.

Why, then, did not the organic branch of the science keep ahead in the development? The answer is to be found in the fact that the search for the "philosopher's stone" led men to investigate inorganic substances to the almost total exclusion of organic bodies. However, after a time, the idea that there could be found an "elixir vitæ," a remedy for all the ills of the body, was joined to that of the "philosopher's stone," and this led to the investigation of organic bodies in their medicinal relations. This brings us to about the fifteenth century.

Still, in the next century those interested in the medicinal chemistry gave so large a portion of their time to mineral substances, that only a few organic compounds, as benzoic acid, wood vinegar, milk sugar, etc., can be found mentioned in writings of their times.

Another error just here served to separate the investigation of organic bodies from that of inorganic, and to give prominence to the latter. This was the belief that, while the composition of inorganic bodies could be determined by synthesis as well as by analysis, that of organic bodies could not. This belief was so enduring that Gmelin, in the first edition of his "Handbook," published in 1817, states that organic bodies cannot be built up by laboratory means from their elements; and about the same time Berzelius enforced the statement by a sentence in the introduction to his "Treatise," of which the following is a somewhat free translation. He says: "In living nature the elements appear to obey very different laws from those in inorganic nature ; the products which result from the action of these elements differ from those with which inorganic nature presents us."

The veil thus thrown over the study of organic bodies was not lifted until 1828, when Wohler accomplished the artificial production of urea. This memorable event opened a new era in the study of organic compounds. Do not think, however, that this one discovery completely

*A class essay read in the course in organic chemistry in the University of Michigan.—*Pharm Era.*

removed the errors just noted. This was only the beginning of a scientific conflict, and was not considered conclusive, since the urea was produced from ammonium cyanate, and this substance had not been prepared from its elements. Then, too, urea was a substance very easily decomposed into carbon dioxide and ammonia, and was only excreted from animal bodies, and must therefore, at most, be only semi-organic. We see to what extremities men will go to maintain a position once taken.

This discovery served to attract the attention of chemists to the subject, and other preparations followed. Then there came up various theories as to structure. The substitution of chlorine and other elements, known only in inorganic chemistry, for hydrogen, narrowed the gulf between organic and inorganic chemistry.

This last was carried to an amusing extreme in one case. Dumas had published his opinion that not only the hydrogen, but the nitrogen and oxygen in compounds containing these elements could be substituted by chlorine and still have a substance retaining the special properties of the original. This was too much for Liebig, who satirically replied that in manganous acetate he had replaced all the hydrogen, oxygen, and manganese, and finally the carbon, by chlorine, and that the resulting substance, although containing nothing but chlorine, retained all the characteristic properties of manganous acetate.

Let us take the following as an example of complete organic synthesis. Vapour of sulphur passed over glowing coke yields carbon disulphide. A mixture of iron and sulphur heated yields ferrous sulphide, and this treated with hydrochloric acid, whose elements need only sunlight to unite directly, yields hydrosulphuric acid. Pass a mixture of hydrosulphuric acid and carbon disulphide over red hot copper, and we have marsh gas. Treating this with chlorine, gives chloroform, which, when heated with potassium hydrate, yields methyl alcohol easily oxidizable to formic acid. This gives the list of methyl compounds by synthesis, and others are as easily prepared.

Thus it is proved that the indefinable agency which we call life does not supersede chemical force, but that the latter operates in the presence as in the absence of the former. This statement does not argue that there is no such agency as life, but rather that the author of both vital and chemical forces does not allow one to usurp the dominion of the others.

TURKEY RED OIL.

THIS article treats of the conditions necessary for successful application of the "Sulphated Oil Process" in dyeing cotton with alizarine red. All recipes for preparing the oil agree in requiring the sulphuric acid to be added very slowly to the oil and with constant stirring, in order to avoid heating during the mixture and the evolution of sulphurous acid in any large quantity. The author describes experiments which demonstrate that the risk of spoiling the product is much less than is commonly supposed. He shows that at temperatures below 70° any evolution of sulphurous acid must be due to albuminoid substances present as impurities in the oil, the oil itself not giving rise to sulphurous acid below that temperature. (The paper is practically confined to the treatment of castor oil, as that is the only one in common use in Russia for Turkey-red dyeing.) The endeavour to avoid any evolution of sulphurous acid may even lead to very imperfect results being obtained, for a low temperature of reaction will leave much of the oil undecomposed—the author's view being that only the fatty acid is of use in the dyeing process. In working on the large scale with 1,000 kilos. of castor oil the author adopts the following procedure. In winter 20 to 30 per cent., and in summer 15 to 20 per cent. of concentrated sulphuric acid are used. About one half of the acid is stirred into the oil during 9 hours of the working day and the mixture is allowed to stand over-night. On the next day the second half of the acid is stirred in and the mixture allowed to stand until a sample gives a clear solution when diluted with water in a test-tube. The bulk is then mixed with an equal weight of water. It is necessary to test a sample frequently, as the mixture will give a cloudy solution in water if either too short or too long a time be given for the reaction. The proportion of free fatty acid may be increased if desired by using hot water for dilution. On allowing the mixture to stand, the oily part separates and floats on the aqueous acid layer, and it is drawn off to be treated with alkali. As some of the best preparations contain only 2 to 5 parts of SO_3 to 100 parts of fatty acids, whereas the sulphonated fatty acid should contain 6 to 15 times more SO_3, it is evident that the sulphonated fatty acid is not of essential importance, and this conclusion is corroborated by an experiment on the large scale in dyeing with fatty acid prepared by saponification with alkali, in which, of course, no sulphonated compound was present; but although the shade produced was very fine, the oil bath showed a tendency to frothing, which caused the dyeing to be somewhat uneven. In order to fit the sulphated castor oil for use as a mordant, it has to be partially neutralized by an alkali, and the author finds that sufficient alkali has been added when it amounts to more than a quarter and less than half that required for theoretical neutralisation. In practice the alkali, either caustic soda or ammonia, or both, is added to the emulsified fatty acid until the mixture becomes suddenly clear, when the right degree of neutralisation has been attained.

The use of ammonia for neutralisation has certain advantages, especially in the finishing and printing of steam colours, because the alkali volatilizes and leaves only the free fatty acid on the cloth. The reason why castor oil has come to be selected as the most suitable for Turkey-red oil dyeing is its property of forming a soluble soap with a minimum proportion of alkali. Solutions of other fatty acids give emulsions rather than clear solutions when the proportion of alkali falls much below that required for complete neutralisation. Again, the decomposition of the oil by the action of sulphuric acid is more complete with castor oil than with any other oil which can be used, and maximum decomposition is essential to the achievement of the best results. A certain proportion of undecomposed oil has, however, the advantage that it lessens the tendency to frothing, and the decomposition by means of sulphuric acid in the case of castor oil provides for the ready attainment of this condition.—*Dingl. Polyt.*

ON THE POLLUTION AND SPONTANEOUS PURIFICATION OF RIVERS.

AT the annual meeting of the German Society of Gas and Water Engineers and Chemists, which was held at Munich in June, Professor V. Pettenkofer delivered an address on the pollution and spontaneous purification of rivers, which will no doubt be of interest to our readers. The address was of special importance to the inhabitants of Munich, because a sewer is being laid down throughout a portion of the town, which opens directly into the Isar, the sewage not being filtered or treated in any way.

The problem of the spontaneous purification of rivers, can only be considered from the theoretical point of view, and each case has to be considered on its merits, since general rules cannot be laid down. That the admission of sewage to a river can actually take place without injury to the dwellers on its banks is proved by many instances, among others by that of the Tiber, into which the Cloaca Maxima (made in 600 B.C.) opens, without doing any harm to the inhabitants near the river. The water of the Elbe, moreover, is drinkable at Altona, although the sewage of Hamburg has been run into it for forty years In the same way no impurities have been detected in the lower waters of the Isar, although the sewage of Munich has hitherto always found its way thither.

As long as only "dirty water" and "wash water" were spoken of no objections were raised, but the word "sewage" has recently caused considerable opposition to the new scheme. Soxhlet has in the meantime shown that at the present date almost 80 per cent of the total sewage finds its way into the Isar. With the present population of 280,000, the organic matter of urine and fæces amounts to 6 milligrammes per litre of water, so that even if spontaneous purification did not take place, no injury could arise with such great diliation. If the population were even doubled, the amount would only be 12 milligrammes per litre. The lecturer showed flasks containing pure water and water containing the quantity of sewage mentioned above, which appeared to be equally clear. It is chiefly due to imagination that water which is perfectly clear is rejected as unfit for use because sewage has been mentioned in connection with it. It must be remembered that no water is absolutely pure, just as the air is not perfectly pure, and yet we manage to live in it very comfortably. Only impurities whose amount can be determined need be seriously considered.

Another source of fear is the tribe of bacilli, which has only recently become known to the generality of people, but of which only the pathogenic members are to be feared. Water which is as clear as crystal, may, nevertheless, contain these. Although the lecturer himself formerly expressed the opinion, that infectious diseases follow the river courses, yet he considers this arises from the underground water, since diseases sometimes spread, not down, but up a river valley. The hospitals and slaughter-houses of Munich have long been drained into the Isar without any evil effects being traced to them. The same is true of Würzburg, where the Julius hospital is drained into the Maine. The bacilli and bacteria in the water, which are invisible to the naked eye, are so minute that 30 millions of them, after drying, only weigh one milligramme. A few miles below Munich, only 92 per cent. of the bacilli found in the Isar near the town, are still present, a proof that something in the course of the river tends to destroy them. Similar observations have been made between Geneva and Lyons on the Rhine, and near Basle. The disease germs soon die in pure water, partly because they fail to obtain sufficient nourishment, and partly on account of the struggle for existence in the presence of the much more numerous harmless bacilli. Although the cause of this spontaneous purification of

rivers still requires explanation, the phenomenon is a well established one. The amount of water in the river does not seem to be so important a factor in producing it as the rate at which the river flows. Taking the average rate as 0·7 metres per second, that of the Isar is 1·2, and that of the Spree, about 0·5. This explains the enormous numbers of bacilli which are found in the last named river below Berlin. It appears, therefore, that although it is necessary in some large towns to keep the sewage out of the rivers by means of filteration fields, this costly arrangement is not invariably necessary, and that, in many cases, sewage can be run directly into a stream without any injury being done to the inhabitants on its lower banks.—*Chem. Zeitung.*

MAC IVOR'S PATENTS, LIMITED.

APPLICATION FOR AMENDMENT.

THOSE of our readers who are concerned with white lead may be interested to learn that Messrs. Ralph Waldo Emerson Mac Ivor, Frederic Arthur Darlington, Gavin Paul, John Allàn, John Byron Umpleby, Leonard Grant, Walter Herbert Cook, Ellis Lever, and Harry William Christmas have applied for leave to further amend the Specification of Letters Patent No. 10.426, 18th July, 1888, granted to Ralph Waldo Emerson Mac Ivor, "For Improvements in the production of white lead or carbonate of lead and the apparatus therefor," alleging as their reasons that: "We desire to disclaim the use of all alkaline acetates (other than acetate of ammonia), as these bodies cannot be employed with advantage. Also we desire to correct certain clerical errors, and to amend certain expressions with a view to render the Specification more accurate and clear." The amendments proposed are as follows:—

On Page 1.

Line 10 To strike out "alkaline acetate."
Line 11 To strike out "more particularly" and "of."
Line 18 To strike out "or other alkaline acetate."
Line 19 To substitute "conversion" for "convertion."

On Page 2.

Line 1 To insert a full stop after "it" and substitute "When" for "when."
Line 3 To strike out "and" and substitute "being" for "is."
Line 6 To insert "but more advantageously without heat" after "heat."
Line 9 To strike out the full stop after "A1."
Line 20 To substitute "The manufacture of" for "That we make."
Line 21 To strike out "or other alkaline acetate."

THE CHILI NITRATE INDUSTRY.

NUMBER OF COMPANIES AND PRODUCTION OF EACH.

THERE are now in Chili no less than 45 works for the production of nitrate of soda, as we learn from the firm of J. Zayas & Co., who are large manufacturers in Iquique, and to whom our thanks are due for the detailed information with which they have provided us on this subject. The various companies combined, until 1887, to regulate production, but many of them had exaggerated their capabilities so as to obtain a larger share in the division of the total production than ought really to have accrued to them. This is at once evident when we examine the detailed statements of the officially declared capability of the company and compare it with the actual production as represented by the exportation during 1888. Certain firms, such as Messrs. Gibbs & Co., whose works have just been purchased by companies of recent formation, produce only about one-half of the amount declared to committee of the syndicate, and others only 11·43, 12·98, and even 8·75 per cent. of their declared production. This state of affairs was abnormal, and injured the large works, and it was this that brought about the abandonment of the syndicate. It is true that the companies could, without doubt, increase their production, but the evidence clearly shows that the productive power of the works was exaggerated in the declarations made before the committee. The formation of a new syndicate is already rumoured. —*L'Engrais.*

Borings for Salt and Coal near Southport.—During the past few weeks, a company of gentlemen have been superintending boring operations at Barton Moss, about seven miles from Southport. Their first object was the finding of salt, which they believed existed in the neighbourhood. This, it is said, they have found, but in excavating deeper in some places they have come upon seams of coal, and it is supposed that it abounds in the neighbourhood.

Analytical Notes.

NEW TEST FOR TANNIN.

C. BOTTINGER has proposed a new test for tannin, which depends upon its reaction with phenylhydrazin. If a little tannin is heated with double its weight of phenylhydrazin for a few minutes to a temperature slightly over 100° C., a little water added, and the whole boiled for a few seconds, and then allowing a drop or two to fall into a large beaker containing water made alkaline with caustic soda, a beautiful blue colouration is developed, which gradually subsides into yellow. If gallic acid is treated in the same way, an orange or golden yellow is produced.

TESTING GUM ARABIC.

Professor Leo Liebermann communicates to the *Chemiker Zeitung* a paper on the examination of gum arabic, in the course of which he states that both Senegal and Cordofan gums should dissolve completely in lukewarm water, whereas cherry-tree gum only partially dissolves, or, at the best, swells up in the water. When the solution is treated with large excess of potash solution and copper sulphate, warmed slightly (not boiled), and filtered, the filtrate and the precipitate may be reserved for examination. The filtrate will contain dextrin if any has been present in the sample, and on boiling it the characteristic brick-red precipitate of cuprous oxide will be formed should that be so. The precipitate formed by the Fehling's solution in the first instance gives the data for conclusions regarding the nature of the gum proper. After washing with distilled water, dissolve in dilute hydrochloric acid and precipitate with a large excess of alcohol. Allow the precipitate half a day or a day to settle, collect it, dissolve in water, and again precipitate with alkali and copper, purifying with hydrochloric acid and water as before. If the sample is pure gum arabic it is noticed that the precipitate thrown down by alcohol gathers into one lump, and a little of it dissolved in water and boiled with solution of potash gives an amber-coloured solution. The gum-senegal precipitate, on the other hand, does not agglomerate, and it gives no colour, or only a straw colour, when boiled with alkali; but if the precipitate does not agglomerate, and gives an amber colour with alkali, the sample is a mixture of gum arabic and gum senegal. It is also noticeable that the blue copper-precipitate formed on adding alkali and copper to the watery solutions of the gums is more abundant in the case of true gum arabic than in the case of gum senegal—indeed, in the latter case the precipitate is not at all abundant.

BISULPHIDE OF CARBON.

A CORRESPONDENT writes:—An interest of a very practical kind attaches to this compound. Carbon bisulphide (Fr., sulphure de carbone) is a colourless, heavy, very mobile and volatile liquid. It is made by the action of sulphur vapour on red-hot charcoal, and is used in the manufacture of waterproof materials, the extraction of oils from seeds, etc. It has a specific gravity of 1·29, and boils at 114·8 deg. F., but volatilizes very quickly at ordinary temperatures. The specific gravity of the vapour is rather more than 2½ times that of atmospheric air, and the vapour not only readily collects near the bottom of any space in which it is produced, but flows along almost like a fluid, and the vapour may thus reach a fire and be inflamed at some distance from its source of production. One of the most striking characteristics of this vapour is the extremely low temperature at which, when mixed with air, it takes fire. According to experiments, this temperature is about 415 deg. F. (some authorites give it considerably lower). If it is borne in mind that the lowest visible red-heat corresponds to a temperature of about 1,200 deg. F., while a bright red-heat, such as is necessary to inflame a mixture of benzolene vapour and air, corresponds to about 2,100 deg. F., it will be seen how very low, relatively speaking, the temperature of ignition is in the case of bisulphide vapour. The smallest spark from iron, a fire, a cinder after it has lost all appearance of fire, an even moderately heated stove, etc., are hot enough to set it on fire. The mere striking together of two pieces of iron within the inflammable atmosphere is sufficient to ignite it. It is not essential that an actual spark should be produced in order to bring about this result, but if the particle struck off is about 415 deg. F., a temperature far below red heat, ignition will result. The above is an abridgement of the evidence of Dr. A. Dupré, taken for the purposes of a recent Board of Trade inquiry into the burning of the Livadia, a Liverpool steamer, which was laden with 150 tons of sulphure de carbone, and with other cargo, at Marseilles, and had to be abandoned by her crew off Cape Cette on May 11 last. The inspector appointed by the Board thought the casuality due to the leakage of one of the drums in which the sulphure was stored, to the formation of vapour, and to its being drawn up the drain pipes through the scuppers, so that it came into contact with a light in the forecastle.

WHISKEY FROM JUTE!

THE revelations recently made before a Select Committee of the House of Commons as to the substances from which some of our modern distillers obtain their whiskey were astounding to many who had not previously heard that potatoes can be utilised for the production of that alcoholic drink. But hundreds of others knew all about it long before the Select Committee published the result of its enquiries. Thousands of barrels of beer brewed in this country are guiltless of hops. This also is a fact not unknown to the multitude. But who in the name of all that is wonderful would ever dream that whiskey can be produced from jute? Very few surely. And yet the statement is made in all seriousness by a reputable commercial journal published at Lille, that the intoxicating drink is obtained from this Eastern textile. The process is so repulsive that one shudders at the rascality of the unscrupulous rogues who do not hesitate to poison a whole community with their vile preparations in order to enrich themselves. The authority mentioned says that endeavours have been made to utilise the saccharine and other constituents of jute for the making of a kind of comestible glucose by the aid of sulphuric acid, or by fermentation, a jute whiskey *(wiskey de jute)* similar in taste to the *eau de vie de grains*. Temperance lecturers who wish to disgust their audiences with the brewing and distilling fraternity might with advantage refer to the process of producing *wiskey de jute*. The next thing we may possibly hear of will be beer from cotton or rum from flax, if this jute whiskey really exists.—*Textile Mercury.*

ON THE MANUFACTURE OF DYE-WOOD EXTRACTS.

THE articles which have been recently published on this subject by Messrs. Soxhlet and Brühl have already excited attention among the German houses connected with this trade, and the following criticism has been sent us by Herr Beyerbach :—

Assuming that the papers referred to above are meant to be looked at from a practical point of view, I must remark that the conclusions which they lead up to are rendered uncertain by a slight vagueness in the assumptions upon which they are based. The determination of the yield of logwood extract by the ordinary rules of percentage is inadmissible, and, considering the extraordinary variety of the raw material, it is not to be wondered at that the two authors do not agree on the point. They also differ in their mode of examining a wood extract, and, therefore, in their valuation of it, and this is actually the main difficulty, since chemistry has not yet devised a scientifically accurate method of determining the strength of wood extracts. Herr Soxhlet assumes that greater concentration leads to a correspondingly greater strength, and, therefore, decides unconditionally in favour of the American process. In this, however, he is undoubtedly in the wrong, and forgets the numerous applications of the extract, which admit of and even require various qualities. The lowering of quality caused by the fall of prices has little to do with science, but always renders work more difficult. It is to be hoped that the consumers will gradually begin to realise that the honesty of the manufacturer is of more importance to them than small differences of price.

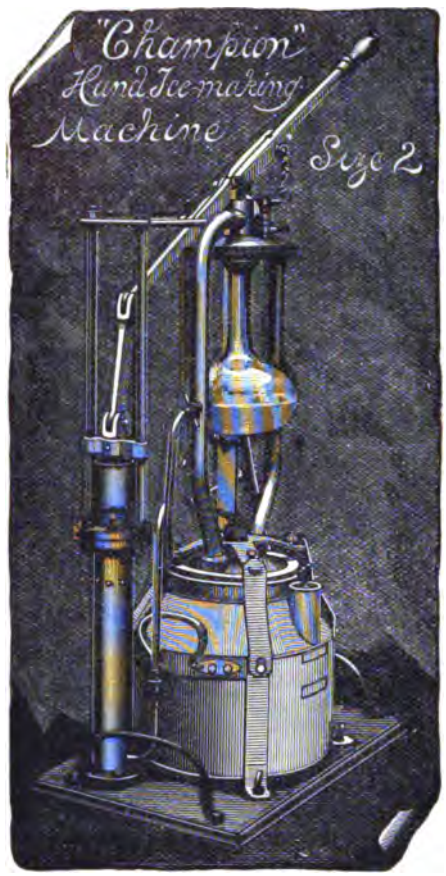
The charges made by both authors against the German extract industry seem to assume without hesitation more scientific knowledge among the competing manufacturers in America and France. This is quite inaccurate, as is also the statement that the German manufacturers make very little use of chemistry in this trade. I am acquainted with a number of extract makers who are quite familiar with this science, and readily call in its assistance, in spite of its comparative weakness in this particular branch. I believe that many of these men could easily show the complete injustice of the charges brought against them by Messrs. Soxhlet and Brühl if their own interest did not restrain them from publishing the advantage which they have laboriously worked out for themselves. It may also be observed that in recent years a steady decrease in the importation and an increase in the exportation of extracts has taken place. The supply of raw material to Germany has also considerably increased, a fact which points most unmistakeably to the growth of the industry. This advance has been made under very unfavourable conditions, since America and France can send the excess of their production to Germany almost unhindered by the duty of 3s. per 100 kilogrammes, while both the countries by a very high protective tariff prevent the German manufacturers from taking their revenge. Moreover, it must be borne in mind that in both these countries the manufacture has been long established, whereas it has only been adopted at a comparatively recent date in Germany.

Some of the German manufacturers who have reliable scientific men at their disposal give to these the greatest influence on the development of the industry.

Chance expressions of opinion to the contrary, such as that which recently occurred in the Leipzig trade report on the drying of furs (an industry of comparatively small importance) should not be so invidiously circulated. For my own part, I shall continue to endeavour to find opportunities to overcome opposition, wherever it may exist, by showing by practical tests the insufficiency of the grounds upon which it is based.

The progress already made will undoubtedly be further increased, especially if the still youthful industry be aided by an increase in the protective duty.—*Chemiker Zeitung.*

THE "CHAMPION" ICE MAKING MACHINE.



REFRIGERATING machinery may be conveniently divided into two classes. In the first we have the large machines such as are used for freezing cargoes of meat, and in abbatoirs, as also for the production of ice in considerable quantities. The second class is composed of those machines, less imposing, but not less useful in their way, which are adapted to meet the thousand and one requirements of every day life. Of this class we commend the "Champion" Ice Making Machines of the Pulsometer Engineering Co., Ltd., London, to the notice of our readers. The general features of these machines may be gathered from the accompanying illustration of the No. 2 size. They are constructed on the well known principle that water will freeze when rapidly evaporated by means of a vacuum pump, and simultaneous absorption of the liberated aqueous vapour by some powerful absorber such as sulphuric acid.

The machine consists essentially of a powerful vacuum pump, shown on the left of the figure of the absorbing vessel fixed to the base, and containing sulphuric acid, and the glass vessel shown above the absorber, to contain whatever is required to be frozen or cooled.

The pump is the most important part of the machine. It will produce a practically perfect vacuum, though worked at a slow and easy stroke (particularly as the air becomes more and more rarefied), and it is impossible that air can leak through the pump, though it should stand for any length of time.

There is no fine mechanical fitting about the pump, and all the working parts being quite free and easy, the friction is reduced to a minimum, and as the machines are handy and moderate in cost, they should meet with a large sale.

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PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

JOSEPH AIRD, GREATBRIDGE.—Iron tubes and coils of all kinds.

ASHMORE, BENSON, PEASE AND CO., STOCKTON-ON-TEES.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

BLACKMAN VENTILATING CO., LONDON.—Fans, Air Propellers, Ventilating Machinery.

GEO. G. BLACKWELL, LIVERPOOL.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

BRUNNER, MOND AND CO., NORTHWICH.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

BUCKLEY BRICK AND TILE CO., BUCKLEY.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

CHADDERTON IRON WORKS CO., CHADDERTON.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. CLAY, EDINBURGH.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

CLAYTON ANILINE CO., CLAYTON.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. CORTIN, NEWCASTLE-ON-TYNE.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. DAGLISH AND CO., ST. HELENS.—Photographs of Chemical Plant —Blowing Engines, Filter Presses, Sludge Pumps, &c.

DAVIS BROS., MANCHESTER.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. DEMPSTER, MANCHESTER.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

DOULTON AND CO., LAMBETH.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. FAHRIG, PLAISTOW, ESSEX.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

GALLOWAYS, LIMITED, MANCHESTER.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

JOHN A. GILBERT AND CO. LTD., LONDON.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

GRIMSHAW BROS., LIMITED, CLAYTON.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

JEWSBURY AND BROWN, MANCHESTER —Samples of Aerated Waters

JOSEPH KERSHAW AND CO, HOLLINWOOD.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. LINDSEY AND CO., CLAYTON.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

CHAS. LOWE AND CO., REDDISH.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

MANCHESTER ANILINE CO., MANCHESTER.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

MELDRUM BROS., MANCHESTER.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. MILNES AND BROTHER, BURY.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

MUSGRAVE AND CO., BELFAST.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

NEWCASTLE CHEMICAL WORKS COMPANY, LIMITED, NEWCASTLE-ON-TYNE.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

ROBINSON, COOKS, AND COMPANY, ST. HELENS.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. ROYLE, MANCHESTER.—Steam Reducing Valves.

A. SMITH, CLAYTON.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

WORTHINGTON PUMPING ENGINE COMPANY, LONDON.—Pumping Machinery. Speciality, their "Duplex" Pump.

JOSEPH WRIGHT AND COMPANY, TIPTON.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

Correspondence.

ANSWERS TO CORRESPONDENTS.

MERCIA.—Write to the Secretary, Great George St, Westminster, S.W.

ALBOCARBON.—Probably, benzole would answer your purpose. Why should you try acetic acid?

RHEUMATIC.—Scarcely a question for our columns. Salol is, as you say, highly recommended, and may be purchased in tabloid form at any first-class druggists.

J. G ATKINSON.—You will probably mean the Thermochemical Researches of Thomson, we believe an English translation has been published, ask your bookseller.

QUICKSILVER —Such a trough as you describe will do very well if made in sheet-iron, and painted with—say—Aspinall's Enamel, two coats.

DRUGGIST'S APPRENTICE.—If you would moderate your expressions somewhat, we might publish your letter. You are a too zealous friend, your facts will do clothed in suitable style.

*** *We do not hold ourselves responsible for the opinions expressed by our correspondents.*

PROFITABLE EXTRAS FOR CHEMISTS.

To the Editor of the Chemical Trade Journal.

DEAR SIR,—If your valuable space will admit, I should like to make a few remarks on your leader of Aug. 2nd. It is a matter which, for some time, I have been expecting one of the leading chemical periodicals to take up, and I am pleased to find the *Chemical Trade Journal* in the van on this point. I fully endorse your treatment of "Profitable Extras." I have myself been a victim to a similar transaction, when compelled by circumstances to obtain a small quantity of brown vitriol from a chemist. The position which they are now assuming, reminds one of the proverbial school boy and his capacity for eating jam. The more you give him the more he wants.

Themselves safely ensconced within the prickly hedge of the law from any invasion of their rights, they would commence to invade the domain of the analyst. It is as well for them that they *are* protected from external competition, save of their fellow sinners, for I could instance a case of a fully qualified chemist who could not supply me with calcium sulphate when asked, but readily produced some plaster of Paris on further enquiry. What the "simple" analyses in this case would be, I fear to foretell. Apologising for trespasing thus far on your space and time,—I remain, dear sir, yours, ANALYST.

THE END OF SMOKE.

(To the Editor of the Chemical Trade Journal.)

SIR,—Your article on *The End of Smoke*, in your issue of August 9th, is all very well so far as it goes. But Mr. Elliott's smoke washer leaves, as far as I can see, one of the worst forms of smoke nuisance untouched and unattempted. I refer to the smoke from "brick-kilns." The highly offensive effluvia from these too cheaply constructed erections is rendered still more so by the fact that it is discharged at a level but slightly, if at all, above that of the average nasal organ. House smoke is bad enough, but that *is* discharged at a higher elevation, though it is far less objectionable than the noxious and sickly effluvia arising from the baking *olla podrida* which nowadays is made into bricks I wonder often whether the alkali inspector's attention has ever been drawn to this subject. Brick-kilns are a source of annoyance in the suburbs of many of our large towns, and must be reckoned with in any scheme for suppressing smoke. In fact, it would be no more unjust to include them with chemical works in any pending or future scheme for extending legislation in reference to noxious gases.—I am, sir, your obedient servant,

A MANCHESTER VICTIM.

WHO CAN BEST BE SPARED?—Young men, this is the first question your employers ask themselves when business becomes slack, and when it is thought necessary to economise in the matter of salaries. "Who can best be spared?" The barnacles, the shirks, the make-shifts, somebody's proteges, somebody's nephews, and especially somebody's good-for-nothing. Young men, please remember that these are not the ones who are called for when responsible positions are to be filled. Would you like to gauge your own future for a position of prominence? Would you like to know the probabilities of your getting such a position? Inquire within! What are you doing to make yourself valuable in the position you now occupy? If you are doing with all your might what your hands find to do, the chances are ten to one that you soon become so valuable in that position that you cannot be spared from it; and then, singular to relate, will be the very time when you will be sought out for promotion for a better place.—*The Medical Record.*

Trade Notes.

Olive on Alizarine Red.—In a sealed paper just opened by the Rouen Society, M. Huntzinger describes a method of printing olive on Turkey red. He prints on a colour made of cœruleine, caustic soda, and thickening; the printed goods are then passed for half a minute through a Mather and Platt steamer, and next exposed to the air for a night, afterwards washing in cold water. They are then dried, passed through a weak sulphuric acid bath, and washed in soap. To get the best results it is necessary to print on scarlet shades of red, obtainable from alizarines containing anthra and flavo purpurine.

A New Process for Hardening Plaster of Paris has been communicated to the French Academy of Sciences by M. Julte. The plaster is mixed with one-sixth of its weight of fine, freshly slaked lime and used with as little water as possible. After it is thoroughly dry it is treated with a saturated solution of either zinc sulphate or iron sulphate. With the first the hardened plaster remains white, while the second by gradual oxidation yields the colour iron rust, which gives a fine imitation of mahogany under an application of linseed oil. —*San. News.*

To Rectify Turpentine.—As it is difficult to obtain nice, clear turpentine for microscopical puposes, I want to give other workers the benefit of my experience in rectifying the ordinary fluid. I proceed as follows: Take one pint of the common turpentine and mix in a quart bottle with four fluid ounces of 98 per cent. alcohol. Agitate well, and let stand until the two fluids separate. Decant the turpentine (which will form the lower layer) from the alcohol, and mix it with one pint of clear water. Agitate thoroughly, and let stand until these two fluids separate, then from the water decant the turpentine (which this time will form the upper layer), and, finally, mix with the turpentine about one ounce of powdered starch, and filter through paper By pursuing the foregoing plan, any one may secure a pure, limpid and brilliant turpentine. The alcohol used in rectifying it need not be wasted, as it will do to burn, to clean slides, or for other purposes. I usually make a large quantity and recover the alcohol by distillation.—*C. C. Faris in The Microscope.*

Salt Peak.—A mass of 90,000,000 tons of pure and compact rock salt, located on an island 185 feet high, which rises from a miserable sea-marsh on the route from Brashear to New Iberia, up the River Teche, Louisiana, is one of the wonders of the world. How this island, which contains over 300 acres of excellent land, ever came into existence in such a locality is a matter of conjecture. Vegetation is prolific, and the scenery is beautiful and varied. In the centre of the island, which is the only solid spot in the vast expanse of sea-marsh for miles around, rises Salt Peak, the largest body of exposed rock salt in the world. Having never been surveyed, its exact extent is, as yet, unknown. An engineer who has but recently visited it estimates that there are not less than 90,000,000 tons of pure crystal salt in sight. The dazzling clearness of the Salt Peak forms a striking contrast to sombre lagoons, bayous, and salt-marshes which surround it on all sides.—*Iron.*

American and Russian Petroleum.—The imports of American petroleum into Western Europe have increased very considerably during the past few years. In 1885, the five ports of Hamburg, Bremen, Amsterdam, Rotterdam, and Antwerp, received altogether, 3,300,000 barrels. Last year, the quantity was close upon 4,000,000. A good deal of enterprise has been shown in developing this trade. One firm has erected oil pumping and barreling plants, both at Rotterdam and Bremerhaven, and have at each port, storage tanks of 90,000 barrels capacity. The same firm has more recently established stores at Mannheim, capable of accommodating 30,000 barrels, and are now making arrangements to extend their line of supply stations along the Rhine, through Southern Germany, into Switzerland. They ship from the United States in bulk by tank steamers, saving by this means 2s. per barrel in freight. They also employ tank barges on the Rhine. Another company is following suit, and erecting pumping works, storage tanks, and barrel factories at Rotterdam, which is an excellent centre of distribution, and is also acquiring stores at Bremen and Hamburg. It is even in contemplation to lay a pipe line from Hamburg to Berlin, a distance of more than 200 miles. Deliveries of Russian oil at the above named ports are less than a tenth of the American supply, and they are actually decreasing. The energy of the Americans has had something to do with this, but the chief reason is that the Russian oil is inferior in quality, gives a worse light, and a stronger smell and smoke. In direct competition the American product sells for 10 per cent. more. Americans charge their Russian competitors with fraudulent practices, such as delivering Russian oil in American tanks, mixing the two together, and using Russian barrels. One fact in connection with the American deliveries is worth notice, that three-fourths of the vessels bringing the oil are English, and the rest German. Not one is under the United States flag.

Manufacture of Filtering Material.—The process consists essentially in reducing ferric oxide by heating it in contact with gaseous fuel. Small pieces of iron ore, preferably hematite, are packed into a retort heated externally, preferably by producer gas. When the charge is at a cherry red heat, gaseous fuel is admitted into the retort and brought into thorough contact with the ore. At the end of four or five hours, if the exit gas be inflammable the process is finished and the charge raked out and allowed to cool. Ordinary coal gas or other gaseous fuel may be used instead of producer gas. The retorts may be oscillated, rocked, raked, etc., by machinery. The magnetic oxide so produced is available for filtering water, sewage, sugar sirups, alcoholic liquors, etc.

Olive Oil in Italy.—A consular report written at Cagliari, Italy, says: "The production of olive oil is much more important in the province of Sassari than in that of Cagliari; we do not know whether it is a matter or question of method in the process of making the oil, or in the system of preserving it, or be it for want of proper outlets, but it is a positive fact that the exports are not very considerable and not very proportionate to the abundance of the oil produced. Honest speculators having sufficient capital to work with, and correspondents out of the island, might realise important profits by making, at the proper moment, ample purchases of oil, and selling it afterwards pure and unadulterated, without having recourse to mixtures and adulterations, which practices throw discredit on the dealer and on the country also.

Composition of Liege Phosphates.—A fair general composition for these phosphates may be taken as follows:—

	55/60	50/55
Insoluble in acids	13·34 %	21·27 %
Water at 100° C.	0·93 ,,	0·85 ,,
Water chemically combined	2·83 ,,	2·53 ,,
Lime	40·64 ,,	38·01 ,,
Magnesia	0·79 ,,	0·81 ,,
Oxide of Iron and Alumina	2·39 ,,	3·30 ,,
Phosphoric Acid	27·25 ,,	25·08 ,,
Carbonic Acid	3·10 ,,	3·00 ,,
Silicates soluble in Hydrochloric Acid	0·80 ,,	0·75 ,,
Calcium Fluoride, Sulphate of Lime, Loss, etc.	5·93 ,,	4·40 ,,

This composition is said to be a good one for the manufacture of superphosphates. The above analyses were furnished to our contemporary *L'Engrais* by the Anglo-Continental Guano Works Co., at Antwerp.

Market Reports.

REPORT ON MANURE MATERIAL.

There has been more business doing during the past week at some advance in price for phosphatic, but without any quotable change for nitrogenous material.

We have no alteration to note in the value of Charleston phosphate rock. Prices for Somme, Osso, and Belgian are maintained, and considerable business is doing in these descriptions of phosphate. We also hear of business in Canadian 70% strength at 12¼d., full delivered terms, ½ rise. For the higher grades of Canadian, we do not think shippers will make any concession on prices last quoted.

Several cargoes of River Plate bones have changed hands at £5. 8s. 9d. to £5. 10s., for shortly due; for later shipments £5. 12s. 6d. now required, and sellers very firm in their ideas. Some business has been done in East India crushed bones for shipment at £5. 6s. 3d. to £5. 7s. 6d., the latter price being now lowest. There have been some large transactions in East India bone meal, in cargoes direct to U.K. ports, but price does not transpire, though it is understood to be £5. 15s.; spot price in Liverpool is still £5. 10s. ex store, but sellers seem inclined to advance. Common grinding bones are worth about £5. ex quay Liverpool.

Nitrate of soda is without much change. Business has been done in handy due cargoes at 8s. 3d., and that price would still be accepted for larger ones. Buyers' ideas are 8s. 2½d. for large cargoes near at hand. September-October shipments may be quoted at about 8s. 7½d. for ordinary quality; for refined about 9s. would have to be paid. Spot prices are 8s. 3d. for ordinary, and 8s. 6d. for refined quality.

Quotation for dried blood remains without change, and we do not hear of any further important business for prompt delivery, but some business has been done for delivery ahead at a shade under spot quotations.

There have been transactions in ground hoof, but prices are not reported. There are sellers at 8s. 9d. to 9s. f.o.r., according to position of works in relation to market.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron rose about 6d. Scotch warrants closing at 47s. 11½d. cash, and 48s. 2½d. one month. Middlesbrough warrants at 45s. 1½d. cash, and hematite warrants at 56s. cash. Copper opened strong; G.M.B. sold at £58. 10s. to £57. 17s. 6d. cash, £58. 12s. 6d. to £58. 2s. 6d. three months. Tin was dull; Straits, £94. cash and £94. 10s. three months; Australian £94. 2s. 6d. cash; English ingots £97. 10s. to £98. Spelter: Silesian ordinary £23. 7s. 6d. to £23. 10s. Lead quiet; Spanish sellers £13.; English £13. 2s. 6d. to £13. 5s. Quicksilver, £10. 5s. first hands, £9. 19s. second. Copper shares: Cape Copper, £2. shares, 4½ to 4¾, 4⅝ acct.; Namaqua (1) £2. shares, 2¾ to 3, 2⅞ acct.; Panulcillo (1) £2. shares, 1⅛ to 1¼, 1¼ acct.; Rio Tinto (1) £10. shares, 22⅞ to 23⅛, 22¾ to 3 1/16 acct.; Do. 5 p.c. 2d. Mt. Bds., 101½ to 102½, 101½ acct.; Mason and Barry 7 1/16 to 7 1/16; Tharsis 5½ to 5¾; Copiapo 2⅞ to 3; Libiola 2⅜ to 2¾.

GLASGOW, Wednesday.—Market strong with a good business. Scotch done at 47s. 8d. to 48s. 2d. cash, also at 47s. 11d. to 48s. 4½d. one month; closing buyers at 48s. 1½d. cash, sellers ask ½d. more. Middlesbrough done at 45s. 1½d. cash, closing with buyers at 45s. 1½d. cash, sellers ask 45s. 3d. Hematite done at 55s. 10d. to 56s. cash, also at 56s. 1½d. to 56s. 4d. one month; closing buyers at 56s. 1½d. cash, sellers ask 56s. 3d.

WOLVERHAMPTON, Wednesday.—The continued satisfactory reports from Glasgow, Middlesbrough, and Barrow, have had a favourable influence in Staffordshire, and a feeling of greater confidence prevails. Steel blooms are quoted £5. 7s. 6d. to £5. 12s. 6d. Best stamping sheet makers ask £11. 10s. for singles. The galvanised iron trade is better, and doubles are £12. 7s. 6d. Ordinary sheets are moving more freely at £7. 5s. for singles. Northampton pigs are more active at 47s. 6d., and Derbyshires command 50s.

MISCELLANEOUS CHEMICAL MARKET.

Spot prices of alkalies have not shown much variation during the week, and current values are, for soda ash, 1¼d. per degree, f.o.b. Liverpool. Caustic soda, 70%, £9. 15s. to £9. 17s. 6d. per ton, and soda crystals, £3. 5s. per ton. For bleaching powder there has been a strong demand, and surplus stocks are fairly well cleared; price for prompt delivery being £5. 10s. per ton, on rails, and £6. per ton, f.o.b. Some business has been done in bleaching powder over 1891, and ruling quotations are now £6. to £6. 5s. per ton at works. Buyers of bleaching powder, however, are not eager to close purchases at this premium. Forward quotations for soda ash are 1 1/16d. to 1⅛d. per degree, and for caustic soda, £9. 15s. to £10. for 70%, and other strengths in proportion. Chlorate of potash is quiet, partly owing to cessation of purchases for American account, pending tariff changes. Price, nominally, 5d. per lb. Sulphur finds steady outlet. Sulphate of copper still without any movement towards an advance, and selling at £18. 10s., in small lots. Quotations firm for future deliveries. The demand continues for potash, and both caustic and carbonate of usual strengths command rather better prices for prompt and forward deliveries. Prussiate of potash, still firm, at 9½d. per lb. Carbolic acids, quiet, and without any movement in price. Aniline oil, scarce at 11d. per lb. Aniline salt, also firmer, at 9¾d. to 10d. per lb. Acetates of lime, quiet, and prices show no change upon last week's quotations. Acetic acids, unaltered.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The market as a whole has been stationary, with a moderate head of business passing, and hardly any change of values worth mentioning. Bleaching powder is about the only article showing fluctuation, and the quotation to-day is still easier by a few shillings. Soda crystals, further influenced by the weather, have gone up a shilling or two. Caustic sodas have remained without change, except in 60/62° cream, which is now obtainable on terms fractionally easier. Sulphate of ammonia stands nominally at the value of a week ago, namely, £11. 7s. 6d., but there has been little of the article placed, and probably £11. 6s. 3d. would be taken in certain quarters if offered—may already have been taken, although not known for a certainty. The enquiry is still chiefly for Glasgow shipment. Last Wednesday's meeting of the Scottish Mineral Oil Association resulted in a drop of a halfpenny in burning oil, at which concession large orders have since been placed towards the covering of approaching consumptive season. Naphtha is now a penny a gallon dearer by agreement, and all the other paraffins are as before, pretty firm and with good prices going. Chief prices current are:—Soda crystals, 55s. net Tyne; alum in lump £5. 2s. 6d. net Glasgow; borax, English refined, £29. 10s, and boracic acid, £37. 10s., net Glasgow; soda ash, 1⅜d. less 5%, Tyne; caustic soda, white, 76°, £12., 70/72°, £9. 17s. 6d., 60/62°, £8. 17s. 6d. and cream, 60/62°, £8. 7s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s, and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1⅛d., less 5% Tyne; saltcake, 32s. to 32s. 6d.; bleaching powder, £5. 5s. to £5. 15s., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5 and 6% to Scotch and English buyers respectively (for export these prices net); chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 4½d.; sulphate of ammonia, £11. 7s. 6d. spot f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3½d.; paraffin spirit (naphtha), 7d. a gallon; paraffin oil (burning), reduced price, 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less). ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 39,774 bags.

TAR AND AMMONIA PRODUCTS.

The benzol market has increased in firmness, and 90's are now value for 4s. 2d. and 50/90's for 3s. There is a good demand still for solvent naphtha, and creosote, though slightly lower in price, is moving off very fast. A large business has been done in anthracene, and buyers are willing to pay 1s. 4d. for A quality, and 1s. 1½d. for B. The pitch market remains *in statu quo*.

In sulphate of ammonia there has been a stiff demand for prompt parcels, and consequently prices are hardening further. There are now buyers at Hull at £11. 10s., but there is very little indeed offering; while at Liverpool, the seat of the principal American demand, £11. 12s. 6d. has been paid for prompt delivery, and a further advance would have to be accorded for any parcels immediately available. Although the Leith market is a little firmer, the pressure is not felt at that port so much, and consequently quotations do not exceed £11. 7s. 6d. Beckton sulphate is £11. 11s. 3d., and the agent states he is not likely to quote less for some time to come.

THE LIVERPOOL COLOUR MARKET.

Colours steady. Ochres: Oxfordshire has been quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc, V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

THE LIVERPOOL MINERAL MARKET.

Our market has continued firm, with a leaning to an advance in prices. Manganese: Arrivals very small, prices somewhat firmer. Magnesite: On account of recent large importations of raw lump, stocks have been further increased, and prices are totally in the hands of buyers; raw ground, £6. 10s., and calcined ground, £10. to £11. Bauxite (Irish Hill brand): The demand continues daily to increase, and prices, therefore, are very strong: Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: Arrivals have come in pretty regular. The demand continues to improve, prices, therefore, are firmer. In some cases there is an advance, especially for G.G.B. "Angel White" brand, 95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate): The production has increased, prices, therefore, somewhat easier; selected crystal lump scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; selected crystal ground, £8. Sulphate: The production of best white has decreased, making prices firmer; best lump, 35s. 6d.; good

medium, 30s. ; medium, 25s. 6d. to 27s. 6d. ; common, 18s. 6d. to 20s. ; ground best white, G.G.B. brand, 65s. ; common, 45s. ; grey, 32s. 6d. to 40s. Pumicestone steady ; ground at £10., and specially selected lump, finest quality, £13. Iron ore easier. Bilbao and Santander, 9s. to 10s. 6d. f.o.b. ; Irish, 11s. to 12s. 6d. ; Cumberland, 9s. to 10s. 6d. Purple ore without alteration. Spanish manganiferous ore in demand. Emerystone : Best brands continue to be inquired for, at full prices. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady ; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal in fair request, without any alteration in prices. Chrome metal, 5s. 6d. per lb. Chrome ore : On account of the falling off in importations, prices of best qualities are firmer. Antimony ore and metal in strong demand at high prices. Asbestos is in strong demand, especially rock, and prices very firm. Potter's lead ore of best and standard brands in request ; powdered, £15. 10s.; smalls, £14. to £15. ; selected lump, £16. to £17. Calamine : Best qualities are scarce, 60s. to 80s. Strontia steady ; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16. ; powdered (manufactured), £11. to £12. Limespar : English manufactured, old G.G.B. brand in demand, and brings full prices ; 50s. for ground English. Felspar, 40s. to 50s. ; fluor-spar, 20s. to £6. Plumbago steady ; Spanish, £6. ; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton ; founders, £5. to £6. ; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel steadier. Chrome iron unaltered at last quotations. Ground mica, £50. China clay : In view of the combination, prices are somewhat firmer—common, 18s. 6d. ; good medium, 22s. 6d. to 25s. ; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), finest quality, 20s. to 22s.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical union has been the chief topic of conversation on the Newcastle Exchange during the past week. It is now reported that nearly all the preliminary arrangements have been completed, and little more is to be done, except to float the scheme and raise the capital necessary for the undertaking. The promoters of the union have now fixed the price of chemicals for forward business, and manufacturers, who for the last few weeks have declined to quote beyond 30th September, are to-day quoting for delivery to the end of the year, at the following rates, viz. :—Bleaching powder, £6. per ton ; soda ash, 1⅜d. per degree, less 5% discount ; soda crystals, £2. 16s. 6d. per ton ; sulphate of soda, £1. 15s. per ton ; chlorate of potash, 5½d. per lb.

There is little change to report in the market for prompt delivery. Prices are firm, with the exception of bleaching powder, which is weak and lower. Caustic soda ash and sulphate are unchanged in price. Soda crystals are in good demand, and quoted about 2s. 6d. per ton higher than last week.

The Newcastle Chemical Works Co., Ltd., have now got a portion of their sulphur recovery plant in operation, and are in the market with rock, roll, and flowers of sulphur.

The following are to-day's market quotations for prompt delivery :—Bleaching powder, in softwood casks, £5. 5s. per ton ; caustic soda, 77%, £10. 10s. per ton ; ground and packed in 3-4 cwt. barrels, £13. 10s. per ton ; soda ash, 48/52%, 1⅜d. per degree less 5% ; soda crystals, £2. 16s. per ton ; sulphate of soda, in bulk, 30s. per ton ; ground and packed in casks, 41s. per ton ; recovered sulphur, rock, in bulk, £4. per ton, packed in bags, £4. 3s. 6d. per ton ; roll, in barrels, £5. 5s. per ton ; flowers, £7. to £8. per ton; chlorate of potash, 4⅞d. per lb. ; silicate of soda, 75° Tw., £2. 10s. per ton ; 100° Tw., £3. 7s. 6d. per ton ; 140° Tw., £4. per ton ; hyposulphite of soda, in 1 cwt. kegs, £5. 15s. per ton ; in 5-7 cwt. casks, £5. 5s. per ton ; pure white sulphate of alumina, £4. 10s. per ton ; blanc fixe, £7. 10s. per ton ; chloride of barium, £8. per ton ; nitrate of baryta, crystals, £18. 15s. per ton ; ground, £19. 5s. per ton ; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

The strike in South Wales has had the effect of considerably raising the price of manufacturing coals here for early delivery. Northumberland and Durham small are quoted from 8s. to 8s. 6d. per ton, and two or three small spot parcels have been sold as high as 9s. 6d. per ton.

New Companies.

HALL'S PATENT GAS CARBURETTER COMPANY, LIMITED.—This company was registered on the 31st ult., with a capital of £10,000., in £100. shares, to acquire certain letters patent, dated 9th January, 1890, for improvements in apparatus for carburetting gas, in accordance with an agreement made 7th May, 1890, between John Dennis Hall, of 15, Vine-street, Liverpool, and Wm. James Davis, of 61, Dale-street, Liverpool. The subscribers are :—

	Shares.
E. J. Chevalier, Waterloo, near Liverpool, brewer	1
T. H. Isherwood, Blundellsands, Liverpool, wool broker	1
W. A. Matheson, Waterloo, Liverpool	1
D. Higson, Blundellsands, Liverpool, brewer	1
W. H. Murdock, M.D., Brownlow-hill, Liverpool	1
J. Coffey, 40, Victoria-street, Liverpool, provision merchant	1
H. J. Frith, 8 and 10, Tiker-street, Liverpool, accountant	1
T. Wiggings, 6 and 8, Duke-street, Liverpool, metal merchant	1

J. G. AND J. PILCHER AND SONS, LIMITED.—This company was registered on the 2nd inst., with a capital of £80,000., in £10. shares, 2,000 of which are 6 per cent. cumulative preference shares, to purchase the business of oil, colour, paint, varnish, railway grease and Japan merchants, carried on by J. G. and J. Pilcher and Sons, the locality of which is not stated. The subscribers are :—

	Shares.
W. F. Pilcher, 23, Grosvenor-place, merchant	1
H. D. Pilcher, Banstead, Surrey, merchant	1
C. H. Langmead, National Liberal Club, merchant	1
H. A. Blyth, Pantheon, Oxford-street, merchant	1
Guy Gilbey, Elsenham Hall, Essex, merchant	1
H. Grinling, Stanmore, Middlesex, merchant	1
G. Taylor, 9, Regent's-park-road, merchant	1

SEDDON'S MIDDLEWICH SALT SYNDICATE, LIMITED. — This company was registered on the 31st ult., with a capital of £30,000., in £10. shares, to carry into effect an agreement made 28th July, between Henry Seddon, Middlewich, Cheshire, of the one part, and James Getliffe Platt, 5, Norfolk-street, Manchester, on behalf of the company, of the other part, to carry on the business of salt manufacturers, &c. The first subscribers are :

	Shares.
W. Gregson, 45, Scarisbrick-new-road, Southport	1
E. Ettock, Chorlton-on-Medlock	1
R. Barlow, West-view-terrace, Radcliffe	1
J. B. Scholes, 88, Blackburn-road, Bolton	1
J. Smith, 5, Ash-street, Southport	1
H. Seddon, Wychouse-lane, Middlewich	1
W. Parker, 5, Norfolk-street, Manchester, solicitor	1

BRITISH GAS LIGHTING IMPROVEMENT COMPANY, LIMITED.—This company was registered on the 28th ult , with a capital of £160,000., divided into 6,000 preference shares of £5. each, 130,000 ordinary shares of £1. each, to manufacture and purify gas, and for such purposes to take over certain patents of Mr. Hiram S. Maxim, for enriching, economising, and making gas. The subscribers are :—

	Shares.
H. S. King, 65, Cornhill, banker	1
W. J. Wright, Montagu-mansions, accountant	1
F. W. Clark, C.E., South Norwood-park	1
A. C. Trotman, 12, Mayer-street, W., private secretary	1
J. V. Miller, 39, Stockade-road, Clapham, accountant	1
A. Gooch, 99, Benthal-road, N.	1
S. G. Chandler, Derby road, Woodford	1

NEW TAMARUGAL NITRATE COMPANY, LIMITED.—This company was registered on the 28th ult., with a capital of £390,000., divided into 130,000 preference and 130,000 ordinary shares of £1. 10s. each, to reconstruct the Tamarugal Nitrate Company, Limited, incorporated February 12th, 1889, with a nominal capital of £650,000., in £5. shares, to purchase nitrate grounds and works known as La Patria and La Palma, in Tarapaca, Chili, and to work and carry on the same. The last return recorded the issue of the entire number of shares, and the payment in full of the total amount of capital. The resolution for winding-up and reconstruction was confirmed July 28th, 1890, and Francis Henry Evans, M.P., was appointed liquidator. The subscribers are :—

	Shares.
Francis Henry Evans, M.P., Orpington, Kent	1
Harvey Berkeley James, 9, Gracechurch-street	1
Thomas Frederick Read, Bromley, Kent	1
George Martin Inglis, 9, Gracechurch-street	1
Richard Kidner, Rosendale-road, Dulwich	1
W. E. West, West-hill, Putney, secretary to a company	1
F. R. Steer, Kilburn, near Derby, clerk	1

WIDNES IRON AND CHEMICAL WORKS, LIMITED.—This company was registered on the 28th ult., with a capital of £60,500., divided into 12,000 ordinary shares of £5. each, and 500 founders' shares of £1. each, to purchase from Charles Bennett the patent No 16,604, and to recover refuse, metals, or any similar materials. The subscribers are :—

	Ord. Shares.
J. B. Joel, Warnford-court, merchant	1
G. E. N. Taylor, 23, Chalcot-crescent, N.W.	1
H. Hindle, 43, Richmond-street, Hammersmith, secretary to a company	1
W. H. Bowman, 91, Borough-road, S.E., warehouseman	1
W. Pearce, 32, Roderick-road, Haverstock-hill, coal merchant	1
A. Smith, 4, Torrington-park-villas, Finchley, accountant	1
F. M. Bell, 15, Southgate-road, N., photographic artist	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

J. SHAW, T. CONNOLLY, and W. S. BROWN, under the style of Shaw and Connolly Newton Heath, nr. Manchester, electrical engineers.

G. H. ELLIOTT and G. KNIGHT, under the style of Knight & Co., Winter Square, Bermondsey, London, manufacturers of disinfectants.

F. J. GEH, and J. BOND, under the style of Geh, Bond & Co., Bristol, drysalters.

Adjudications.

EDMUND PANKHURST, New Cross Road, Deptford, and Rolls Rd., Old Kent Rd. London, oil and colour man.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Distillation of Mineral Oils. J. Laing. 11,757. July 28.
Treatment of Rubber Hose-pipes. C. Macintosh & Co., Limited and Jno. Dempsey. 11,764. July 28.
Improved Method of Dyeing. A. Goldthorp. 11,765. July 28.
Automatic Boiler-feeding Apparatus. G. G. Picking and W. Hopkins. 11,779. July 28
Manufacture of Oil Paint in Sheets. J. A. Maynard. 11,780 July 28.
Compound Plates of Cement, Plaster, and the like. E. Dupont. 11,796. July 28.
Artificial Manures. H. Moon. 11,800. July 28.
Manufacture of Phenyldimethylpyrazoline. L. Scholvien and L. F. Riedel.
Blowers and Exhausters. W. A. Carlile. 11,813. July 29.
Heating and Purifying Boiler Feed Water. J. E. Carroll. 11,823. July 29.
Coke Bricks. W. L. Wise. 11,839. July 29.
Alloying Metals by Vapour. F. Wicks. 11,841. July 29.
Electrolytic Deposition of Metals. G. L. Anders and J. R. Shearer. 11,842. July 29.
Bricks. C. Walton. 11,843. July 29.
Reduction of Zinc and other Metals.—(Complete Specification.) C. Rabache. 11,851. July 29.
Apparatus for Ensilage. M. Tweedie. 11,859. July 29.
Electric Switches.—(Complete Specification) W. W. Strode and C. G. Gill. 11,863. July 29.
Feed Water Injectors. ,, ,, C. Phillips. 11,867. July 29.
Copper Furnace. ,, ,, W. W. Keys. 11,868. July 29.
Yarn Dyeing Machines. ,, ,, H. H. Lake. 11,873. July 29.
Manufacture of Steel. H. H. Lake. 11,877. July 29.
Rotative Cement Kilns. L. Johnstone 11,895. July 30.
Manufacture of Lead Wire. J. Legay and L. Legay. 11,919. July 30.
Elevating Liquids by Compressed Air.—(Complete Specification.) P. Tarda 11,934. July 30.
Refining Cotton Seed and other Fatty Oils. G. Tall. 11,956. July 31.
Grinding Mills. W. Whitaker, senr. and W. Whittaker, junr. 11,965. July 31.
Production of Acid Sulphates. W. B. Giles, F. G. A. Roberts and A. Boake. 11,979. July 31.
Oxidising and Drying Vegetable Oils. F. Walton. 12,000 July 31.
Lixiviating Apparatus. L. Ménetral. 12,004. July 31.
Stirring and Drawing Gas Retorts. W. Foulis. 12,016. July 31.
Raising Liquids by Compressed Air.—(Complete Specification). J. Leliévre. 12,027. July 31.
Patent Fuel.—(Complete Specification). I. Lilley and G. H. Hopkins. 12,036 August 1.
Dephosphorizing Iron Ore. J. Pointon. 12,040. August 1.
Mechanical Stokers. J. W. Macfarlane. 12,042. August 1.
Treatment of Iron or Steel previous to Casting. G. A. Jarvis. 12,045. August 1.
Automatic Boiler Feed Apparatus. A. Mahew. 12,059. August 1.
Manufacture of "Mineral White." J. J. Lee. 12,085. August 1.
Centrifugal Machines for Pulpy Materials.—(Complete Specification). J. Selvig and B. Lange. 12,097. August 1.
Steam Jets for Impelling Air or Gas. J. E. Mathewson. 12,122 August 2.
Preparation of Rapidly Drying Oils or Varnishes. G. Macaulay Cruikshank. 15,123. August 2.
Artificial Fuel. F. V. Hadlow. 12,134. August 2.
Steam and Gas Generators. E. Foreman. 12,153. August 2.
Grinding Mills. W. J. Fraser and T. C. Palmer. 12,156. August 2.
Instantaneous Steam Generators. L. Serpollet and La Société des Générateurs á Vaporisation Instantanée (Systeme Serpollet). 12,164. August 2.
Apparatus for Measuring Electrical Energy. L. A. W. Desruelles and R F. O. Chauvin. 12,169. Aug. 2.

IMPORTS OF CHEMICAL PRODUCTS

LONDON.

Week ending Aug. 2nd.

Alkali—
Holland, 400 c. R. W. Greef & Co.
,, 20 t. E. Olyett & Co.

Acetic Acid—
Holland, 100 pkgs. Beresford & Co.

Acetate of Lime—
U.S, 424 pkgs. Johnson & Hooper

Acetate Amyl—
Germany, £25 F. Stahlschmidt & Co.

Alum—
Holland, £30 Ohlenschlager Brs.

Arsenic—
Germany, 80 pkgs. W. Balchin

Antimony—
Germany, 24 t. C. Tennant, Sons & Co.
Japan, 27 t. Elkan &Co.

Antimony Ore—
Portugal, 30 t. L. & I. D. Jt. Co.
N. Zealand, 40 J B. Cree
Germany, 51 H. R. Merton & Co.
France, 31 Pillow, Jones & Co.
Portugal, 30 H. Emanuel
Japan, 25 Cookson & Co.
,, 6 G. N. Souratty & Co.
France, 15 H. Emanuel
,, 5 Allatini Brs.
Spain, 30 J. J. Pratt & Son
Italy, 1 A. Polimeni

Barytes—
Germany, 24 cks. Petri Bros.
,, 32 C. Turner & Sons
Belgium, 22 Lake & Williams
Germany, 20 Petri Brs.
,, 23 O. Hara & Hoar
Belgium, 14 cs. W. Harrison & Co.
Germany, 48 cks. W. Harrison & Co.
Belgium, 20 W. A. Rose & Co

Boracic Acid—
Italy, 20 pkgs. J. Puddy & Co.
Germany, 10 Beresford & Co.

Barium Chloride—
Germany, Petri Brs.

Brimstone—
Italy, 35 t. Pigon, Wilks & Co.
,, 65 J. Kitchin, Ltd.
,, 5 C. Tennant, Sons & Co.
,, 5 J. Houghton & Sons
,, 10 C. Vincent
,, 20 G. Boor & Co.
,, 50 C. J. Capes & Co.
,, 10 F. Smith

Bone Ash—
Adelaide, 10 t. Quirk, Barton & Co.

Caoutchouc—
Zanzibar, 292 c. L. & I. D. Jt. Co.
France, 3 Kebbel, Son & Co.

Caoutchouc—*continued.*
E. Indies, 3 t. 14 c Petrocochino Bros.
,, 3 J. A. Hadden & Co.

Chemicals *(otherwise undescribed)*
Holland, £80 Barr Moering & Co.
,, 10 Phillipps & Graves
Jamaica, 45 Hales, Caird & Co.
Germany, 30 T. H. Lee
,, 10 Kaul & Haenlein
,, 10 L. & I. D. Jt. Co.
,, 67 Spies. Bros. & Co.
,, 523 A. & M. Zimmermann
Holland, 200 F. Bartlett
Germany, 15 L & I. D. Jt. Co.
,, 585 A. & M. Zimmermann
,, 53 T. H. Lee
,, 9 Phillipps & Graves

Camphor—
Germany, 12 pkgs. L. & I. D. Jt. Co.
,, 64 tubs R. Warner & Co., Ltd.
,, 4 pkgs. L. & I. D Jt. Co.

Cream of Tartar—
Italy, 10 pkgs. D. Taylor & Sons
France, 5 M. Ashby
,, 5 B. & F. Wf. Co., Ltd.
,, 10 W. C. Bacon & Co.
,, 3 T. Ronaldson & Co.
Spain, 12 B. & F. Wf. Co., Ltd.

Caustic Potash—
France, 43 pks. J. Knight & Son
,, 10 J. A Reid

Carbonic Gas—
Holland, £240 J. G. Fisher

Carbolic Acid—
Germany, 3 pks. Schluter & Co.

Dyestuffs—
Extracts
France, 180 pks. L J. Levinstein & Sons
Norway, 1 Johnsen & Jorgensen
France, 25 W. Bauer & Co.
Germany, 395 A. J. Humphery
U. S., 25 pkgs. W. Burton & Sons
,, 5 W. W. Young
Argols
France, 2 N. Steinberg
Austria, 199 Thames S. T. Co.
Indigo
France, 1 cs. Schenker & Co.
E. Indies, 16 chts. Stahlschmidt & Co.
,, 14 J. Owe
Anthracene
Holland, 30 pks. Burt, Bulton & Co.

Gambier
Singapore, 186 pks. Lewis & Peat
,, 120 E. Boustead & Co.
,, 445 Williams, Torrey & Co.
,, 223 W. H. Cole & Co.
,, 223 R. & J. Henderson
,, 269 bgs. S. Barrow & Bro.
,, 350 Elkan & Co.
,, Holland, 450 pks. Cox, Patterson & Co.
Singapore, 1,085 L. & I. D. Jt. Co.
,, 448 Prop. Butler's Wf.
,, 219 Brinkmann & Co.
,, 341 J. H. & G. Scovell
Holland, 450 J. Barber & Co.
Singapore, 871 W. H. Cole & Co.
,, 167 P. & S. Evans &Co.
,, 40 Prop. Butler's Wf.
France, 198 pks. Beresford & Co.
,, 423 L. & I. D. Jt. Co.
,, 413 T. J. & T. Powell
,, 635 W. H Cole & Co.
,, 498 M. Whitwill & Son

Myrabolams
E. Indies, 3,299 pks. Beresford & Co.
,, 425 J. P. Alpe & Co.
,, 61 Anderson, Weber & Smith
,, 355 A. Hagan
,, 1,115 Hoare, Wilson & Co.

Divi Divi
Kingston, 259 pks. G. T. Benton & Son
E Indies, 17 Arbuthnot, Latham & Co.

Fustic
Jamaica, 26 t. Hales, Caird & Co.
,, 1 t. E. D & F. Man
,, 9 L. & I. D. Jt. Co.

Valonia
Smyrna, 53 t. Anning & Cobb
,, 211 Hicks, Nash & Co.

Tanners' Bark
Adelaide, 151 t. J. Vicary & Sons
Holland, 10 Sawer, Mead & Co.
Adelaide, 150 Baxter & Hoare
,, 58 Dyster, Nalder & Co.

Sumac
Italy, 280 pks. Beresford & Co.
,, 1,000 bgs. Brown & Elmslie

Cochineal
Canaries, 14 pks. Price, Hickman & Co.
Teneriffe, 1 pkg. F. Huth & Co.

Alizarine
Holland, 5 pks. J. Forsey

Dyestuffs *(otherwise undescribed)*
France, 1 pkg. Hernu, Peron & Co.
,, 240 L. J. Levinstein & Sons

Glucose—
U. States, 108 pks 354 cwt. L. & I. D. Jt. Co.
,, 400 400 Barrett, Tagant & Co.
, 20 120 Petty, Wood & Co.

Glucose—*continued.*
Germany, 50 405 L. Sutro & Co.
France, 200 200 J. Barber & Co.
,, 300 300 De Paiva Norman & Co.
,, 100 100Rothbarth & Co.
Germany, 100 110Union Lighterage Co., Ltd
,, 150 220 H. A. Litchfield & Co.
U. States, 30 164 Barrett, Tagant & Co.
,, 500 500Union Lighterage Co., Ltd.
Germany, 5 42 T. H. Lee
,, 33 311 J. Knill & Co.
,, 5 40 G. J. McCaul & Co.
,, 12 110 H. Lorenz
,, 120 120 Prop. Chamberlain's Wf.
,, 200 200 J. Barber & Co.
,, 200 200 Baxter & Hoare
,, 200 200 C. S. Lovell
,, 200 200 Dutrulle, Solomon & Co.
,, 60 160 H A. Litchfield & Co.
,, 200 200 J. Frank & Co.
,, 100 100 Botolph & Nichs. Whvs. Co., Ltd.

Gutta Percha—
France, 1 t. 13 c. Kleinwort, Sons & Co.
Penang, 4 c. L. & I. D. Jt. Co.
,, 3 E. Boustead & Co.
,, 441 H. W. Jewesbury & Co.
Singapore, 11 t. 4 c. Kaltenbach & Schmitz

Glycerine—
France, £300 Prop. Chambl'ns. Wf.
Holland, 180 Spies Bros. & Co.
,, 460 ,,
N. Russia, 590 Leach & Co.

Isinglass—
N. Russia, 5 pkgs. J. Vickers
Singapore, 5 Kebbel, Son & Co.
E. Indies, 34 L & I. D. Jt. Co.
Penang, 22 ,,
Singapore, 10 ,,
N. Russia, 2 Sry. Coml. Dk.
Penang, 14 L. & I. D. Jt. Co.

Insect Powder—
Austria, £90 Major & Field

Iron Bromide—
Germany, £400 A. & M. Zimmermann

Manure—
Belgium, 180 t. A. Hunter & Co.
,, 340 London Manure Co.
Germany, 50 Perkins & Homer
France, 25 Forwood Bros. & Co.
Germany, 11 W. Pope & Co.
Spain, 10 G. Bennett & Sons

Phosphate Rock
Montreal, 250 t. A. Hunter & Co.
Manganese Ore—
Egypt, 2 t. Quirk, Barton & Co.
N. Z., 139 William & Sparrow
Magnesia—
Holland, £320 A. & M. Zimmermann
Naphtha—
Holland, 50 drs. Burt, Boulton & Co.
,, 15 cks. Lister & Biggs
Oxalic Acid—
Norway, 13 pkgs. J. Kitchin, Ld.
Pitch—
Sweden, 260 cks. C. B. Leighton
Pyrites—
La Laja, 200 t. Forbes, Abbott & Co.
,, 350 G. Ward & Sons
,, 150 Forbes, Abbott & Co.
Pomaron, 1,080 Mason & Barry
Huelva, 1,195 Societe Commerciale
Plumbago—
E. Indies, 100 brls. J. Owen
,, 193 Barrow & Gibson
,, 193 Props. Sun. Whf.
Germany, 20 cks. Brown & Elmslie
,, 51 ,,
Holland, 4 ,,
Germany, 20 cs. T. H. Lee
Potash—
Montreal, 4 t. 4 c. Charles & Fox
U. S, 4 pkgs. M. D. Co.
Potassium Muriate—
Holland, 26 pkgs. H Johnson & Sons
Potassium Oxymuriate—
Germany, 100 pkgs. J. Boor & Co.
Potassium Carbonate—
France, 9 cks. J. A. Reid
Germany, 34 Ross & Deering
,, 5 pkgs. W. Bauer & Co.
France, 11 Beresford & Co.
Potassium Sulphate—
Germany, 63 pkgs. H. Lambert
,, 11 ,,
,, 29 D. de Pass & Co.
,, 54 Petri Bros.
Phosphoric Acid—
Germany, 20 pkgs. Phillipps & Graves
Permanganate—
Germany, £46 Spies Bros. & Co.
Pearl Ash—
France, 5 t. F. W. Berk & Co.
Montreal, 2 9 c. Charles & Fox
France, 120 Petri Bros.
Quinine Sulphate—
Holland, £580 F. W. Heilgers & Co.
Sugar of Lead—
Germany, 4 pkgs. Spies Bros. & Co.
Sodium Acetate—
Holland, 15 pkgs. T. H. Lee
,, 9 Soundy & Son
Sodium Muriate—
Holland, 57 pkgs. Kaltenbach & Schmitz
Sodium Nitrate—
Holland, £50 J. Owen
Saltpetre—
Germany, 57 cks. J. Watt & Son
,, 46 brls. P. Hecker & Co.
E. Indies, 571 bgs. Lucas & Spencer
,, 1,359 Ralli Bros.
Germany, 190 cks. P. Hecker & Co.
Tar—
Germany, 200 brls. Lenck Mœller & Co.
Tartaric Acid—
Holland, 20 pkgs. B. & F. Wf. Co., Ltd.
Germany, 20 O. Andre & Co.
Holland, 18 Middleton & Co.
,, 19 B. & F. Wf. Co., Ld.
,, 10 Middleton & Co.
,, 26 B. & F. Wf. Co., Ltd.
Ultramarine—
Germany, 4 cks. H. Brooks & Co.
Holland, 20 Hernu Peron & Co.
,, 20 Seaward Bros.
Belgium, 2 cks. Leach & Co
Zinc Oxide—
Holland, 300 pkgs. Soundy & Son
Germany, 89 brls. M. Ashby, Ltd.
,, 45 cks W. A. Rose & Co.

LIVERPOOL.

Week ending August 5th.

Aluminium—
Antwerp, 13 cs. J. T. Fletcher & Co.
Alum—
Rotterdam 41 cks.
Acetic Acid—
Rotterdam, 6 btls.
Aniline Oil—
Hamburg, 9 cks.
Bones—
Maranham, 40 t. H. Evans
Borax—
Rouen, 21 cks. H. Coghill
Charcoal—
Rotterdam, 110 bgs.
Copper Ore—
Lisbon, 1,568 bgs. Richardson & Co.
Montreal, 59 brls. A. Baker
Caoutchouc—
Rangoon, 448 bgs.
Addah, 13 brls. F. & A. Swanzy
,, 1 cs. 9 cks. W. J Rodatz & Co.
,, 1 3 J. P. Werner
Accra, 15 Edwards Bros.
,, 1 Radcliffe & Durant
,, 41 J. P. Werner
,, 16 J. J. Fischer & Co.
,, 7 C. Lane & Co.
,, 10 Herschell & Co.
,, 1 ck. Hutton & Co.
Cape Coast, 4 cks. C. L. Clare & Co.
,, 1 Ihlers & Bell
,, 9 cs. W. B. M'Iver & Co.
,, 20 A. Miller, Bros. & Co.
,, 1 ck. Edwards Bros.
,, 2 Waite & Co.
,, 1 Challenor & Co.
,, 2 13 J. Smith
,, 1 2 W. D. Woodin
,, 3 Taylor, Laughland & Co.
,, 2 Mordaunt Bros.
,, 1
Sierra Leone, 6 brls.
Bathurst, 23 cks. A. Reis
,, 3 Cie Francaise
Ambriz, 1 Daunas & Co.
Kinsembo, 7 Taylor, Laughland & Co
,, 3 2 bgs. T. Millington & Co.
Mussera, 8 Samson & De Liagre
Ambrizette, 9 Taylor, Laughland, & Co.
,, 45 Samson & De Liagre
,, 1 J. Holt & Co.
Muculla, 9 Taylor, Laughland & Co.
,, 21 Samson & De Liagre
Boma, 17 brls. A. M. Maniar
Black Point, 1 Edwards Bros.
Loango, 3 cks. ,,
Cape Lopez, 15 J. Holt & Co.
Gaboon, 8 A. Heyder & Co.
,, 4 Daumas & Co.
Elobey, 6 J. Holt
Ukaka, 21 Hatton & Cookson
Cameroons, 3 Ridley, Son & Co.
,, 8 J. Holt & Co
,, 3 Lucas Bros. & Co.
Akassa, 487 bgs. Royal Niger Co.
Old Calabar, 2 1 cs. W. Dodd & Co.
,, 1 African Assen.
,, 1 Pickering & Berthoud
Bay Beach, 3 F. & A. Swanzy
Saltpond, 3 4 cs. Pickering & Berthoud
,, 4 3 Edwards Bros.
,, 3 C. Lane & Co.
,, 6 1 Radcliffe & Durant
,, 2 1 A. Millerson & Co.
,, 6 2 L. Hart & Co.
Havre, 7 Cunard S. S. Co.
Saltpond, 3 W. B. M'Iver & Co.
,, 2 N. P. Nathan & Sons
,, 4 cs. Challenor & Co.
,, 11 5 A. Miller, Bros. & Co.
,, 1 3
Sierra Leone, 19 brls. Pickering & Berthoud
,, 10 pkgs. 7 1 pn. Paterson, Zachonis & Co.
New York, 20 Pickford & Co.
,, 3 cs. C. Macintosh & Co.
Caustic Potash—
Dunkirk, 42 dms.
Dyestuffs—
Cutch
Calcutta, 1,011 bgs.
Rangoon, 626 bxs.
Sumac
Palermo, 50 bls.
Gambier
Amsterdam, 540 bgs.
Rotterdam, 180
Singapore, 1,259 bls.
,, 419
Fustic
Vera Cruz, 2,700 logs. Bourne, Graham & Co.
Myrabolams
Calcutta, 1,558 pkts.
Extracts
Marseilles, 66 cks. Frankenclein & Co.
Antwerp, 17 cs J. T. Fletcher & Co.
New York, 10 brls.
Orchella
Magdalena Bay, 7,805 bls. Wilson, Meyer & Co.
Las Palmas, 1 T. W. Wood & Co.
Valonia
Havre, 66 bgs.
,, 47
Argols
Oporto, 23 cks.
,, 46 German Bank of London
Glucose—
Hamburg, 121 cks.
Stettin, 48 200 bgs.
Glycerine—
Rotterdam, 7 cbys. 3 cs. 1 drm.
Amsterdam, 20 30
Rotterdam, 5
Rouen, 25 pkgs. P. Behrends
Isinglass—
Maranham, 4 cks. Gunston, Sons & Co.
,, 4 pks. H. Rogers, Sons & Co.
Potash—
Montreal, 25 brls. Wilson, Paterson & Co.
Dunkirk, 11 cks. 18 dms.
Paraffin Wax—
Rangoon, 387 bxs.
Phosphate—
Ghent, 3,533 bgs. J. T. Fletcher & Co.
Montreal, 655 t. Phosphate Guano Co.
Phosphate Rock—
Montreal, 475 t.
Beaufort, 2,314 t. J. Adger & Co.
Montreal, 200
Pitch—
Rotterdam, 10 cks.
Amsterdam, 17
Archangel, 200
Phosphate of Lime—
Brussels, 270 t.
Pyrites—
Huelva, 2,056 t. Matheson & Co.
Stearine—
Antwerp, 26 bgs.
Sulphur Ore—
Huelva, 1,667 t. Matheson & Co.
Sodium Nitrate—
Rotterdam, 3 cks.
Saltpetre—
Calcutta, 455 bgs T. & J. Brocklebank
,, 2,854
Hamburg, 5 cks.
Calcutta, 976 bgs.
Turpentine—
Savannah, 2,383 brls.
Brunswick, G.A. 800
Tar—
Archangel, 4,562 brls
Tartar—
Bordeaux, 12 cks.
Tartaric Acid—
Rotterdam, 20 cks.
Ultramarine—
Hamburg, 31 cs.
Verdigris—
Bordeaux, 2 cks.
Zinc Oxide—
Antwerp, 10 brls. J. T. Fletcher & Co.
,, 40 30 cks.
,, 60

GRIMSBY.

Week ending August 2nd.

Chemicals *(otherwise undescribed)*
Hamburg, 30 pks.

TYNE.

Week ending August 6th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.
Copper Precipitate—
Pomaron, 3,780 bgs. Mason & Barry
Manganese Ore—
Hamburg, 300 t. J. C. Swan & Co.
Plumbago—
Hamburg, 18 cs. Tyne S S. Co.
Sulphur Ore—
Pomaron, 846 t. Mason & Barry
Drontheim, 600 R. S. Story & Co.
Salt—
Harburg, 149 t.
Hamburg, 130
Saltpetre—
Hamburg, 2 cks.
Zinc Oxide—
Antwerp, 25 brls. Tyne S. S. Co.

GLASGOW.

Week ending August 7th.

Barytes—
Rotterdam, 23 cks.
Chemicals *(otherwise undescribed)*
Rotterdam, 4 cs.
Chloral Hydrate—
Hamburg, 1 cs.
Dyestuffs—
Alizarine
Rotterdam, 96 cks. 1 bx.
Amsterdam, 202 1 cs. J. Rankine & Son
Valonia
Marseilles, 510 brls.
Smyrna, 100 t.
Saffron
Marseilles, 1 cs.
Glycerine—
Marseilles, 100 drms.
Guano—
Tromsoe, 550 sks.
Phosphate—
Montreal, 250 t.
Tartar—
Bordeaux, 5 cks. J. & P. Hutchinson
,, 2
Tartaric Acid—
Marseilles, 8 brls.
Waste Salt—
Hamburg, 150 cks.

GOOLE.

Week ending July 30th.

Alum—
Rotterdam, 13 cks.
Caoutchouc—
Boulogne, 6 cks.
Dyestuffs—
Alizarine
Rotterdam, 20 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 152 cks. 42 cs. 7 pks.
Glucose—
Hamburg, 100 bgs. 25 cks.
Dunkirk, 120
Potash—
Dunkirk, 21 cks. 47 drms.
Phosphate—
Ghent, 800 bgs.
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 20 cks.
Soda—
Rotterdam, 100 bgs. 5 cks.
Waste Salt—
Hamburg, 1,157 cks. 161 bgs.

HULL.

Week ending August 7th.

Arsenic—
Hamburg, 5 cks. Bailey & Leetham
Barytes—
Antwerp, 22 cks. H. F. Pudsey
Bremen, 24 Veltmann & Co.
,, 23 Tudor & Sons
,, 4
Rotterdam, 38 Furley & Co.

Chemicals *(otherwise undescribed)*
Stettin, 23 cks. Wilson, Sons & Co.
Copenhagen, 3 ,,
Rouen, 6 Rawson & Robinson
Bremen, 1 Veltman & Co.
Antwerp, 8 pks. Wilson Sons & Co.
Dunkirk, 32 ,,
,, 21
Hamburg, 2 cks. ,,
Gothenburg, 8 pks. ,,

Caoutchouc—
Hamburg, 1 cs. C. M. Lofthouse & Co.
,, 1

Chrome Chloride—
Rotterdam, 10 cks. Hutchinson & Son

Dyestuffs—
Madders
Rotterdam, 5 cks. Geo Lawson & Sons
Alizarine
Rotterdam, 59 pks. 9 cks. W. & C. L. Ringrose
3 cs. Hutchinson & Son
Rotterdam, 8 cks. Geo. Lawson & Sons
,, 35 Hutchinson & Son
,, 3 W. & C. L. Ringrose
Extracts
Rouen, 60 cks. Wilson, Sons & Co.
Rennet
Copenhagen, 1 ck. Wilson, Sons & Co.
Amsterdam, 2 pks. W. & C.L. Ringrose

Ferro-Manganese—
Rotterdam, 20 cks. Furley & Co.

Glucose—
Hamburg, 10 cks. Woodhouse & Co.
Stettin, 10 Wilson, Sons & Co.
,, 600 bgs. C. M. Lofthouse & Co.
Hamburg, 10 Rawson & Robinson
,, 25 Wilson, Sons & Co.

Horn Piths—
Bremen, 8,479 pcs. Wilson, Sons & Co.

Manure—
Kainit
Hamburg, 100 bgs. A. E. Peacock

Naphthol—
Rotterdam, 12 cks. W. & C. L. Ringrose

Oxide—
Rotterdam, 15 cs. Hutchinson & Sons

Plumago—
Hamburg, 1 brl.
,, 34 cks. Wilson, Sons & Co.

Phosphate—
Ghent, 160 t. Wilson, Sons & Co.

Phosphorus—
Hamburg, 1 cs T. F. Bell & Co.

Phosphate Rock—
Port Royal, 2,291 t. Hammond, Emes & Co.
Rouen, 20 cs.

Soda—
Rotterdam, 8 cks. Geo. Lawson & Sons

Sulphate—
Antwerp, 100 bgs. Aire & Calder N. Co.
,, 40 cks. H. F. Pudsey
,, 25 brls. W. S. Merrikin

Sulphur Ore—
Seville, 1,100 t.

Tar—
Gamla Karleby, 400 brls. 400½ brls.

Ultramarine—
Rotterdam, 2 cks. G. Lawson & Sons

EXPORTS OF CHEMICAL PRODUCTS

LONDON.

Week ending July 30th.

Ammonium Sulphate—
Emmerich, 120 t. £1,440
Valencia, 349 4 200

Ammonium Carbonate—
Dunkirk, 1 t. 11 c. £41

Alum—
Robart, 2 t. 5 c. £12

Ammonia—
Cadiz, 1 t. £50

Ammonium Muriate—
Sydney, 11 c. £14
Melbourne, 1 t. 3 30

Brimstone—
Pernambuco, 50 kgs. £24

Bisulphite of Lime—
Karachi, 1 t. 15 c. £17

Cream of Tartar—
Cossack, 3 c. £16
Newcastle, 4 cs. 22
Adelaide, 10 55
Townsville, 3 18
Auckland, 5 30

Carbolic Acid—
Barcelona, 2 t. £174

Coal Products—
Pitch
Cape Town, 12 kegs £10
Alexandria, 250 bls. 79
Madras, 80 rlts. 39
Tar
Karachi, 100 rlts. £53
Natal, 25 19
Malmo, 50 bls. 23
Malta, 10 13
Benzole
Calais, 20 puns. £462
,, 10 cks. 233
Rotterdam, 40 667
,, 50 rlts. 380
,, 66 pkgs. 1,260
Naphthaline
Marseilles, 28 cks. £19
Hamburg, 134 bgs. 17 96
Anthracene
Dusseldorf, 65 cks. £343
Rotterdam, 42 234
Dusseldorf, 64 483
Carbolic Acid
Rotterdam, 40 cks. £440
Hamburg, 3 t. 3 c. 366
Creosote
Bordeaux, 1,999 bls. £812
Naphtha
Treport, 10 puns. £300

Citric Acid—
M. Video, 2 c. £15
Lisbon, 4 27
Genoa, 1 t. 150
Batoum, 3 24
B. Ayres, 1 7
Dunedin, 1 8
Fremantle, 1 7
St. Petersburg, 2 10 372
Lisbon, 6 kgs. 39
Genoa, 1 149
Alexandria, 5 32

Caustic Soda—
Batoum, 43 t. 11 c. £435

Carbolic Solid—
Treport, 1 t. 19 c. £147

Copper Sulphate—
Melbourne, 40 kegs. £225

Copperas—
Robart, 2 t. 7 c. £6

Chemicals *(otherwise undescribed)*
Champion Bay, 10 kgs. £13

Disinfectants—
Bombay, 370 gals. £70
Penang, 650 90
Launceston, 8 cs. 46
Wellington, 2 29

Guano—
Amsterdam, 30 t. £300
Hamburg, 230 1,334

Muriatic Acid—
Algoa Bay, 10 c. £8

Manure—
Rouen, 300 t. £1,860
Stettin, 300 3 c. 1,195
Gothenburg, 341 1 1,477
Riga, 541 11 1,694
Hamburg, 100 1,200
Valencia, 94 1c 822
Barcelona, 2 10
Stettin, 400 2,000
Riga, 48 130

Nitric Acid—
Algoa Bay, 8 c. £14

Oxalic Acid—
New York, 2 t. £75
Sydney, 12 c. 25

Potassium Chlorate—
Sydney, 5 t. £214
Christiania, 1 46
Hong Kong, 1 10 c. 70

Potash—
Rotterdam, 1 t. 10 c. £50

Potassium Nitrate—
Barbadoes, 9 t. 18 c. £183

Saltpetre—
Brisbane, 1 t. 1 c. £22
Pernambuco, 101. . 1 c. 237
Brisbane, 5 5
Sydney, 5 110

Saltcake—
Antwerp, 115 t. £220

Sheep Dip—
Natal, 97 pkgs. £130
Algoa Bay, 300 gals. 70
,, 40 cs. 80
Natal, 100 drs. 21
,, 5 t. 8 c. 205
E. London, 4 9 228
Natal, 8 5 106 cs. 722
Otago, 9 12 235
E. London, 2 14 112

Salt—
St. Johns, 10 t. £20

Soda Ash—
Melbourne, 11 t. £89

Superphosphate—
Natal, 5 t. £22
Las Palmas, 12 43

Salammoniac—
Gothenburg, 1 t. 3 c. £40

Sulphuric Acid—
Natal, 2 t. 5 c. £68
Singapore, 1 18 19

Superphosphate of Lime—
Auckland, 100 t. £446

Tartaric Acid—
Sydney, 2 t. £300
Newcastle, 4 cs. 27
Sydney, 10 c. 62
Havana, 1 t. 145

LIVERPOOL.

Week ending August 2nd.

Alkali—
Rotterdam, 37 cks.

Acetic Acid—
Vera Cruz, 5 cks. £12

Alum—
Calcutta, 8 t. 3 c. 1 q. £36
Beyrout, 2 14 14
Bombay, 8 4 43
Seville, 11 6 64
Sydney, 1 1 5
Valencia, 4 3 22
Carril, 16 1 5
Catania, 1 5 6
Beyrout, 5 11 28
Lima, 17 3 6

Ammonium Carbonate—
Genoa, 7 t. 2 c. 1 q. £68
Leghorn, 1 32
Hamburg, 19 24
Odessa, 1 33
Carril, 10 16

Ammonium Muriate—
Antwerp, 6 c. 1 q. £8
Hamburg, 10 150
Philadelphia, 31 t. 5 3 q. 730
Santander, 10 15
New York, 4 15 117
Philadelphia, 6 5 141

Ammonium Sulphate—
Antwerp, 100 t. 15 c. £1,125
Bordeaux, 4 19 2 q. 46
Oporto, 19 11
Arucas, 18 18 3 229
Bordeaux, 10 3 3 135

Bleaching Powder—
Antwerp, 14 cks.
Baltimore, 130
Boston, 483
Chicago, 50
Hamburg, 23
Leghorn, 7
Oporto, 20 brls.
Philadelphia, 50 cks.
Trieste, 7 brls.
Antwerp, 15 cks.
Boston, 814
Catania, 12
Genoa, 66 cks. 30 pps. 86 kgs.
Hamburg, 85 cks.
Lisbon, 25

Borax—
Amsterdam, 2 t. 3 c. 1 q. £50
Ibrail, 11 3 17
Rotterdam, 19 25
Seville, 19 3 28
Antwerp, 1 8 1 38

Brimstone—
Sourabaya, 5 t. 18 c. £39

Calcium Chloride—
Sydney, 5 t. £11

Caustic Soda—
Valencia, 15 cks. 175 dms.
Rotterdam, 50
Rouen, 70
Samarang, 53
Santander, 30
Seville, 12 150
Sourabaya, 4
Nantes, 18
New Orleans, 100
New York, 350
Palermo, 10
Philadelphia, 150
Port Natal, 21 cs. 6 bxs.
Leghorn, 20 dms.
Lisbon, 20
Malaga, 100
Messina, 20
Monte Video, 10
Montreal, 20
East London, 11 cs.
Ghent, 36

Caustic Soda—*continued.*
Hamburg, 2 dms.
Ibrail, 18
Lagos, 11
La Guayra, 11
Acajutla, 8 cks.
Antwerp, 132
Barcelona, 50 65
Bilbao, 69 28
Boston, 410
Brisbane, 4
Dunedin, 68
Amsterdam, 118 dms.
Barcelona, 100 84 brls.
Bilbao, 112
Bombay, 54
Boston, 100 10
Buenos Ayres, 8
Catania, 40
Genoa, 66
Havre, 6
Leghorn, 89
Melbourne, 30
Monte Video, 84
Montreal, 106
New York, 947
Odessa, 100
Philadelphia, 13
Seville, 200
Tampico, 11
Tarragona, 6
Trieste, 15
Valencia, 20
Vigo, 15

Carbolic Crystals—
Hiogo, 1 t. 15 c. £82

Carbolic Acid—
Hamburg, 15 c. 2 q. £71
Yokohama, 4 1 23
Genoa, 1 t. 96
Havre, 2 9 c. 177
Barcelona, 7 3 37
Philadelphia, 5 26
Rouen, 1 2 95
San Francisco, 7 2 28
St. Louis, 4 19 3 352

Caustic Potash—
Chicago, 9 t. 3 c. £212

Charcoal—
Rotterdam, 48 t. 12 c. 3 q. £206

Chemicals *(otherwise undescribed)*
Vera Cruz, 10 pks. £77
Hamburg, 69 t. 10 c. 688

Cobalt Oxide—
New York, 8 c. 3 q. £428

Copperas—
Calcutta, 13 t. 15 c. £26
Alexandria, 19 15 34
Beyrout, 4 15 10
Larnaca, 2 18 6
Galatz, 4 14 7

Copper Sulphate—
Gd. Canary, 13 c. 1 q. £15
Talcahuano, 10 t. 207
Havre, 10 1 12
Naples, 1 3 20
Odessa, 2 11 3 50
Samsoun, 19 3 19
Valparaiso, 6 126
Singapore, 3 7 63
Corunna, 10 10
Hamburg, 12 3 14
Havre, 2 15 58
Odessa, 1 1 1 23

Cream of Tartar—
Halifax, 19 c. 2 q. £100

Disinfectants—
Marseilles, 2 t. 9 c. £171

Epsom Salts—
Rio de Janeiro, 50 kegs.
Buenos Ayres, 24 brls.
Halifax, 14

Gypsum—
New York, 8 t. 18 c. 1 q. £26

Manure—
Gd. Canary, 10 t. 1 c. £47

Phosphate—
Hamburg, 16 t. 10 c. £80

Phosphorus—
Shanghai, 1 t. 10 c. £70

Potassium Bichromate—
Aleppo, 7 c. £13
Samsoun, 11 17
Leghorn, 9 t. 27

Potassium Carbonate—
Boston, 12 t. 17 c. £180

Potassium Chlorate—
Hamburg, 5 t. £233
New York, 2 10 c. 128
Corunna, 10 21
Vigo, 1 45
New York, 12 10 564
Montreal, 10 25
Naples, 1 5 60
Santander, 1 50
Rotterdam, 5 216
Valencia, 10 27
M. Video, 16 38
Hiogo, 5 221

Salammoniac—
Alexandria, 1 t. £35
Amsterdam, 6 c. 9
Beyrout, 11 3 q. 21
Patras, 4 7
Salaora, 9 1 16
Syra, 7 13
Bombay, 2 13 2 94
Malta, 14 27
Genoa, 5 2 10
Smyrna, 16 27
Corunna, 3 5

Salt Cake—
Baltimore, 201 t 15 c. £479

Soda—
Alexandretta, 10 kegs

Sodium Bicarbonate—
Alexandria, 206 kgs.
Antwerp, 15 2 cks.
Auckland, 320
Calcutta, 500
Constantinople, 20
Dunedin, 300
Dunkirk, 20
Genoa, 90 6
Leghorn, 50
Lisbon, 120
Madras, 50
Melbourne, 834 20
Montreal, 31
,, 585 13
Naples, 20
Newcastle, 28
Salonica, 30
Seville, 20 8 brls.
Syra, 20
Valencia, 40 6
Yokohama, 1,500

Sodium Silicate—
Bombay, 16 cks.
Corunna, 8 bls.
M. Video 20 cks.
Montreal, 18
Valencia, 35 brls. 16
Alicante, 10
Carthagena, 12
Venice, 32

Soda Crystals—
Malta, 50 brls.
New Orleans, 67 cks.
Sydney, 128 brls.
Smyrna, 3 cks.
Cape Town, 25
Genoa. 5

Soda Ash—
Baltimore, 139 cks.
Boston, 84 cs. 174
,, 23
B. Ayres 100
Naples, 20
New Orleans, 7
New York, 206
Philadelphia, 131
Rio Janeiro, 15 brls.
Baltimore, 611 cks. 161 tcs.
Barcelona, 185 brls.
Bilbao, 70
Boston, 298 197
Constantinople, 54
Latakia, 15
Leghorn, 36
Tampico, 32 bgs.
Carthagena, 10

Sodium Carbonate—
Boston, 61 brls.

Salt—
Iquique, 1 t.
Mandyi, 15
Montreal, 324
New York, 1,000
Old Calabar, 251
Opobo, 50
Port Natal, 605
Rotterdam, 200
Saltpond, 63
Sandheads, 3,265
Sierra Leone, 25
Trinidad, 55
Valparaiso, 3
Wellington, N.Z., 213
Westervik, 358
Algoa Bay, 5
Antwerp, 75
Barbadoes, 25
Benin, 17
Boston, 435
Brettesnaes, 800
Brussels, 1
B. Ayres, 200 cs.
Cape Town. 23
Dunedin, 15
East London, 25
Faroe Islands, 70
Hamburg, 110
Iceland, 134
Bahia, 1 2 c.
Baltimore, 200
Black Point, 10
Calcutta, 2,670
Cameroons, 40
Ghent, 121
Iceland, 209

Saltpetre—
Pirœus, 7 t. 10 c. £162
Larnaca, 1 18 3 q. 41
Savanilla, 4 6

Sodium Biborate—
Hamburg, 10 t. 1 c. 1 q. £302

Sodium Bichromate—
Leghorn, 3 t. 11 c. 2 q. £85

Sodium Nitrate—
Almeria, 3 t. 4 c. 1 q. £27
Cartagena, 3 16 31

Sheep Dip—
Cape Town, 220 drs. 30 cs. £104
Baltimore, 2 t. 7 c. 1 q. 60
Napier, 11 bxs. 24
Punta Arenas, 15 cks. 30
Port Natal, 7 15 c. 410
Cape Town, 100 drs. 40 cs. 225

Sulphur—
Rangoon, 2 t. £9
Boston, 30 135
New York, 25 1 c. 106

Sulphuric Acid—
Coquimbo, 3 cs. £8
Madras, 15 c. 9

Superphosphate—
Riga, 699 t. 19 c. 3 q £2,467

Tartaric Acid—
Madras, 2 c. £15
Talcahuano, 1 8
Carril, 2 13

Tar—
Ibrail, 19 cks.
,, 20

Yat Waste—
Madras, 10 t. 2 c. £23

Zinc Chloride—
Bombay, 2 t. 9 c. 1 q. £38

Zinc Muriate—
Bombay, 17 cks. £148
,, 8 t. 13 c. 139

GLASGOW.

Week ending August 7th.

Acid *(otherwise undescribed)*
Madras, 2 t. 13 c. £26

Ammonium Sulphate—
Demerara, 82 t. 19 c. £878
Rouen, 9 19½ 120

Ammonium Carbonate—
Christiania, 10 kgs. £10

Brimstone—
Trinidad, 3 t. 7 c. £20

Caustic Soda—
Dunedin, 11 t. 18 c. £119

Guano—
Java, 402 t. 2 c. £4,038

Gutta Percha—
Amsterdam, 195 lbs. £14

Manure—
Java, 294 t. 9 c. £3,300
Rouen, 35 210

Potash—
Rotterdam, 15 cks. £190

Potassium Bichromate—
Dunedin, 1 t. 2 c £31
Bergen, 5 cks. 53
Rotterdam, 14 168
Rouen, 13 t. 17¼ £455

Paraffin Wax—
Dunedin, 11 t. 4 c. £400
Natal, 1 2 30
Santander, 60
Rouen, 112 209

Pearl Ash—
Dunedin, 1 t. 3 c. £26

Pitch—
Gothenburg, 79 t. 18 c. £200

Sulphuric Acid—
Madras, £37. 10s.

Sodium Bichromate—
Rouen, 2 t. 17¼ c. £63

Superphosphate—
Christiania, 50 t. £200

Tar—
Calcutta, 89 t. 17 c. £380

TYNE.

Week ending August 6th.

Ammonium Sulphate—
Antwerp, 50 t.

Alumina Sulphate—
Rouen, 4 t. 13 c.

Anthracene—
Rotterdam, 23 brls

Alkali—
St. Petersburg, 9 t. 18 c.
Hamburg, 10 11
Antwerp, 5
Newfairwater, 10 7
Rotterdam, 5 2

Bleaching Powder—
St. Petersburg, 98 t. 1 c.
Gothenburg, 15 2
Hamburg, 94 5
Antwerp, 188 8
Newfairwater, 10 18
Helsingfors, 16
Sornas, 40 1
Malmo, 7 1
Rotterdam, 15 9
,, 5 4
,, 16 19

Barytes Carbonate—
Rouen, 50 t.

Bones—
Rouen, 10 t. 8 c.

Caustic Soda—
Gothenburg, 50 t. 4 c.
Antwerp, 2 12
Danzig, 1 3
Odessa, 36 5
Rouen, 17

Ground Flint—
Rotterdam, 2 t. 3 c.
Danzig, 20 5

Iron Oxide—
Malmo, 1 t. 14 c.

Litharge—
Dunkirk, 5 t. 10 c.
Hamburg, 2 9
Rouen, 1 1

Magnesia—
Hamburg, 17 c.

Potassium Chlorate—
St. Petersburg, 5 t.
Rotterdam, 1
Newfairwater, 5

Plumbago—
Bilbao, 4 t. 17 c.

Soda Ash—
Gothenburg, 10 t. 7 c.
,, 2 16
Hamburg, 2 11
Antwerp, 5 15
Newfairwater, 71 3
Helsingfors, 5 10
Odessa, 4 15

Salammoniac—
St. Petersburg, 5 t. 7 c.

Soda Crystals—
Antwerp, 2 t. 4 c.

Superphosphate—
Nykjobing, 42 t. 2 c.
Nakskov, 242 7

Soda—
Helsingfors, 43 t. 8 c.
Nykjobing, 5 18
Odense, 17 7
Nakskov, 4 6

Sodium—
Hamburg, 1 c.

GRIMSBY.

Week ending August 2nd.

Chemicals *(otherwise undescribed)*
Dieppe, 72 cks. 210 pks.
Rotterdam, 5

GOOLE.

Week ending July 30th.

Bleaching Preparations—
Antwerp, 15 cks.
Rotterdam, 43

Benzole—
Antwerp, 24 cks.
Rotterdam, 17 drs.

Coal Products—
Antwerp, 2 cks.
Dunkirk, 52

Chemicals *(otherwise undescribed)*
Hamburg, 13 cks.

Dyestuffs *(otherwise undescribed)*
Boulogne, 10 cks. 2 cs. 5 drs.

Manure—
Boulogne, 35 bgs.
Helsingborg, 489 t.

HULL.

Week ending August 5th.

Alkali—
Bergen, 2 cks.

Brimstone—
Christiania, 32 bgs.

Bleaching Powder—
Amsterdam, 10 cks.
Drontheim, 38
Riga, 94

Charcoal—
Ghent, 4 cks.

Copper Sulphate—
Riga, 10 cks.

Caustic Soda—
Antwerp, 18 drms.
Dunkirk, 18
Helsingfors, 20
Konigsberg, 72
Libau, 70
Riga, 169
St. Petersburg, 35 drms.

Chemicals *(otherwise undescribed)*
Amsterdam, 4 cks.
Antwerp, 4 cs. 5 60 pks.
Boston, 50
Bremen, 54
Christiania, 172 slbs. 8 15
Christiansand, 339 slbs.
Copenhagen, 50 pks.
Hamburg, 130 cs. 3 27
Konigsberg, 5 16
New York, 30 200
Norrkoping, 10
Riga 20 146
Rotterdam, 51 31 44
St. Petersburg, 1 113
Stettin, 1 75

Dyestuffs *(otherwise undescribed)*
Antwerp, 2 cks.
Christiania, 1
Hamburg, 18 7 cs.
Rotterdam, 23 bgs. 3 1
Stettin, 2
Reval, 80
St. Petersburg, 2

Ferro Manganese—
Riga, 79 cks.

Manganese—
Melbourne, 12 cks.

Manure—
Aalborg, 230 t.
Gothenburg, 510 bgs.
New York, 572

Tar—
Christiania, 28 cks.
Helsingfors, 5
Hamburg, 5
Rotterdam, 6
Stockholm, 10
Stavanger, 4

PRICES CURRENT.

WEDNESDAY, August 13, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 % and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	64/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	1	0½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2½
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 38/-		
,, Nitrate .. . . per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	10	0
Aniline Oil (pure) .. .. per lb.	0	0	11
Aniline Salt ,, ... ,,	0	0	9¾
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	10	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	11	15	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	2	6
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	4
Benzol, 90 % nominal .. .. .. per gallon	0	4	2
,, 50/90 ,, ... ,,	0	3	0
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7¼
,, (crude 60°) .. .. per gallon	0	2	0
Creosote (ordinary) .. .. ,,	0	0	2½
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	5	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	57	17	6
,, Sulphate .. .. ,,	18	10	0
,, Oxide (copper scales) .. .. ,,	52	10	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	2	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° o.p. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° o.p. .. .. .. ,,	0	4	4½
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton.	19	15	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	22	15	0
,, ,, (Caustic Potash) 75/80 % .. ,,	21	15	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	0	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	2¾
,, Nitrate .. .. ,,	0	2	8
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	0	0
,, ,, (Soda Crystals) .. .. ,,	2	17	6
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	10	15	0
,, ,, (74 % Caustic Soda) ,, .. ,,	10	10	0
,, ,, (70 % Caustic Soda) ,, .. ,,	9	17	6
,, ,, (60 % Caustic Soda, white) .. ,,	9	0	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	8	15	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	3
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8
,, Barium, 95 % .. .. ,	0	0	5½
,, Potassium .. .. ,,	0	0	8¼
Sulphur (Flowers) .. .. per ton.	8	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	98	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	5	0

THE

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Notices.

All communications for the *Chemical Trade Journal* should be addressed, and Cheques and Post Office Orders made payable to—

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Advertisements intended for insertion in the current week's issue, should reach the office by **Wednesday morning** at the latest.

Communications for the Editor, if intended for insertion in the current week's issue, should reach the office not later than **Tuesday Morning.**

Articles, reports, and correspondence on all matters of interest to the Chemical and allied industries, home and foreign, are solicited. Correspondents should condense their matter as much as possible, write on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication. Sketches should be sent on separate sheets.

We cannot undertake to return rejected manuscripts or drawings, unless accompanied by a stamped directed envelope.

Readers are invited to forward items of intelligence, or cuttings from local newspapers, of interest to the trades concerned.

As it is one of the special features of the *Chemical Trade Journal* to give the earliest information respecting new processes, improvements, inventions, etc., bearing upon the Chemical and allied industries, or which may be of interest to our readers, the Editor invites particulars of such—when in working order—from the originators; and if the subject is deemed of sufficient importance, an expert will visit and report upon the same in the columns of the *Journal*. There is no fee equired for visits of this kind.

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LAY IGNORANCE.

WE are told *ad nauseam* that we live in an age of education and progress, moral and material, and in a certain limited sense it is unfortunately too true. The achievements of some vague personage usually referred to as Science (with a large S), and credited with belonging to the female sex when the average newspaper writer feels specially inspired, are sung with a fervour mercifully tempered with inanity. It must not be supposed, however, that this new Diana of the Ephesians is always treated with reverence. Let a colliery explosion occur, a balloon accident happen, or an intoxicated booby upset a kerosene lamp, and the same writer, with the versatility of an African aborigine, abuses his fetish in good round terms. "Such calamities it is the function of Science to avert; let her discover means to render them impossible, or she will fail in her manifest duty," sings the quondam encomium-monger, blissfully ignorant that neither the performances he praises nor the misfortunes he deplores concern science in even the remotest degree. Such a half-educated mind fails to perceive that science can, in the nature of things, deal only with the observation of phenomena and the elucidation of the laws which govern them, and must leave the application of the principles discovered to the inventor and the craftsman. It is they he must rate, if bent on scolding someone other than the careless or ignorant victim of his own folly, but in this there is little zest. Invention in the abstract seems somehow less attractive than Science as a target for abuse, and to attack any particular invention in the concrete is attended with the possibility of a certain degree of unpleasantness in the shape of a lawyer's letter, so he decides to belabour his traditional idol.

All this would be amusing were it not so very sad; it must be remembered that a newspaper should reflect with more or less accuracy the tone of opinion current among its readers, and these, in the case of a non-technical paper, mean the general public. If such balderdash is received without comment, and even with approval, it is pretty evident that it about fits the mental calibre of a large number of persons, many of whom believe themselves intelligent. For such a state of things our system of education is partly answerable, though at least as weighty a cause is to be found in what seems an innate repugnance in the human mind to the reception of natural knowledge—*i.e.*, science—as opposed to the artificial fabric of information (for it is not *knowledge*) which has resulted from the tortuous cogitations of byegone generations on their own mental mechanism, and the doings of their contemporaries. Such being the condition of both writers and their audience, it is hardly surprising to find the average lay paper guilty on the minor count of gross ignorance of technical subjects.

It may be said that these do not come within its province, and that it cannot be condemned for falling into errors when dealing with them. Such an argument rather recalls that urged by the defendants of an action which made some little stir not so very long ago, when they declined to fulfil an obli-

gation which the plaintiffs in the same action asserted they undertook as guarantors, on the ground that, having considered the matter more maturely, they were of opinion that when they gave the guarantee they were acting *ultra vires*. Indeed, it cannot be taken seriously; but the point overlooked is that the ignorance pleaded has no business to exist; no one expects even an omniscient daily paper to be conversant with all the technical details of every industry, but, at least, there should be familiarity with the broad principles underlying them. What would be thought of a man who claimed to be educated, while unblushingly confessing his ignorance of the literary alphabet? What should be thought of him who openly avowed his want of knowledge of the commonest natural facts—the ABC of science? To the cynic such pitiful proceedings afford the keenest delight. It is excellent sport to watch the flounderings of some leviathan of the press neatly spitted with the keen harpoon of the scientist. Hardly less gratifying, and often vastly more amusing, is it to see the same monster delicately tickled by the quack and paradoxist. Start a scheme for extracting gold from sea-sand, lure a reporter into a room where there is dust, noise, and, if possible, smell, perform a few mild tricks on the level of parlour magic, supply him with eleemosynary whiskey and cigars, and, lo! a paragraph eulogistic, if vague, is the result, and the company may go to allotment. Now and again it happens that a quite gratuitous display of ignorance occurs, of which the following may serve as an illustration:—A London evening paper, by no means the least enterprising or worst informed, in commenting on the appearance of the copper cupolas of the Metropole at Brighton, lamented their garishness, and wished to intimate that they would improve by exposure, but, instead of saying so in ordinary language, went out of its way to assert that they would speedily become coated with *cupric oxide*, a substance, as it sagely observed, which, in spite of its unattractive name, is of high decorative merit. Poor innocent, which failed to acquire in its salad days the elementary knowledge that cupric oxide is *black*!

KAINIT.

THE use of kainit as a fertilizer is almost universal in Germany, and has extended largely into other parts of Europe, the coffee plantations of Brazil and Ceylon, and is now commanding the earnest attention of farmers in the United States. Its use as a fertiliser has increased to an enormous extent from a comparatively small beginning, and has attained an importance equal to that which Peruvian guano reached years ago. Thousands of tons have been exported annually, and the quantity is increasing rapidly.

An analysis of kainit shows that it contains sulphate of potash, 24·80%; sulphate of magnesia, 14·30%; chloride of magnesia, 12·62%; chloride of sodium (common salt), 32·00%; moisture, 14·36%; insoluble matter, 1·92%; total, 100,000. Guaranteed 23% sulphate of potash.

It is chiefly valuable for the potash contained in it, which is an ingredient of every cultivated plant, and without which none can grow. Potash is necessary for the formation of starch in the leaves, stalks, &c., for without it the plant cannot assimilate the materials needed for its growth, nor show any increase in weight. It is a well-known fact that all plants absorb potash from the soil—some to a greater extent than others; as, for instance, hay, clover, corn, tobacco, hops, potatoes, and roots absorb largely, whilst grain crops exhaust it less. Commercial fertilisers, such as superphosphates, bone, fish, and slaughter-house refuse, &c., contain little or no potash. The well-known Peruvian guano yields but a small percentage. It will be interesting in this connection to note carefully the following remarks made by Dr. Franz Giersberg, a celebrated professor of agriculture in Germany, in lectures delivered by him, by order of the German Government, before agricultural societies throughout the empire. After alluding to the nourishment of plants in general, and the most beneficial materials needed for such nourishment, he says: "There is no doubt about the fact that the application of bone-dust, as well as other phosphates, to the soil, may and will produce large yields for several years, the soil, by reason of such application (mainly in connection with nitrogen), being stimulated to more vigorous action. The soil yields largely of the nourishment which, in addition to phosphates, all plants necessarily require, but, as no compensation is allowed for the absorption of the former, we, but too often, experience the result that where a soil receives only phosphate manuring for a length of time it will become eventually entirely unproductive. Phosphate manuring only restores to the soil the one, omitting the other nourishments needed for the active thriving of the plants, and as a consequence, the soil and crops deteriorate in quantity and quality. One-sided manuring will not produce satisfactory results for any length of time, but we may justly claim and expect for the use of potash salt (kainit) a larger and better fertility, since potash is absorbed by most plants in double, even four times, larger quantities than phosphates.

Thus it will be seen that potash is absolutely essential as a plant food, but the expense attending the artificial production of it, by boiling sea water, would be too enormous to entitle it to serious consideration. Nature, in anticipation of its exhaustion from our lands, has made ample provision for a plentiful supply, by a process of evaporation of sea water on an enormous scale in Germany, and, as a result, we have kainit, containing the nourishment needed, at a trifling expense. There are furnished abundant indications that in the older States the available supply of potash has become greatly reduced, and must be replenished, or the crops will fail. We are now passing through the same costly and bitter experience that the farmers on the other side of the Atlantic had to encounter, and we must seek the same remedy that they applied so successfully—kainit.

The value of sulphate of magnesia contained in kainit, as a plant food and an aid in the development of seed, has not received the careful consideration that its great importance deserves. Experiments made from time to time, prove that the quantity of magnesia in seed greatly exceeds the quantity in straw, and furnishes ample evidence that it is indispensable to the perfect formation of seed. For instance, we find in the ashes of grains of wheat 12 per cent. of magnesia, in conjunction with 30 per cent. potash; in rape seed 12 per cent. magnesia, and 23 per cent. potash, and in all other seeds a similar proportion.

It is a great aid in the proper and thorough diffusing of potash through the soil, bringing it within reach of the roots, and at the same time effecting a prompt and complete action of the ammonia of manures used.

Chloride of sodium (common salt) is useful in rendering other materials available.

In order to allow the chlorine combinations contained in kainit, which may be injurious to some plants, to lose its effect on such plants, it is recommended that kainit be applied as long as possible before the seed is sown, as, for instance, in the late fall for the following season's crop, thereby securing the benefit of all rain or snow falling in the meantime, and a consequent deep and thorough incorporation of the kainit ingredients through the soil—those which may be injurious sinking deeply and beyond the reach of the roots of plants to be grown, those which are beneficial and nourishing being within a ready access of all the roots, and not confined in single places. This method of applying kainit will prove itself highly advantageous, whether alone or in combination with stable manure, farm refuse, phosphates, or other fertilising materials, and should be strictly adhered to, unless positively impracticable.

It is recommended by many who have made a study of the effects of kainit that it be mixed with an equal part of lime, as experiments have proven such application to have been highly advantageous, not only in the yield, but in surely overcoming the possible danger of any injury to the plants by the chlorine combinations above mentioned.

It may be safely laid down as a rule that calcareous (lime), light and sandy soils, and those composed largely of decayed vegetable matter, are deficient in potash, while clayey and loamy soils are more plentifully supplied. In either of these cases, however, the supply necessary for perfect growth may not only be reduced, but almost exhausted by constant cropping.

Regarding the quantity of kainit necessary for one acre, and the proportion to be used in combination with phosphates, etc., it is recommended that from 200 lbs. to 400 lbs. be used alone, spread broadcast, as long before crop is planted as possible; and at the proper time one-half of that quantity of phosphates, if latter is needed. To all farmers, whether acquainted or not with kainit manuring, we will say that it will be better to use little and often than a greater quantity at long intervals.

For the benefit of those who may not be acquainted with kainit, its use and results, we will add the following notes regarding the results on different crops after its application.

For oats, wheat, corn, and the like, an application of 300 lbs. kainit in the fall and the proportionate quantity of phosphate in the spring,

per acre, showed, by many experiments, vastly improved yields over former manurings, both in the strength and stand of the straw and size of the grain.

Kainit, whose fitness as a prominent fertilising mineral manure is world-wide known, will also act when applied to the soil in preventing, to a large extent, the disastrous effects of the disease known under the name of "rust."

This disease is visible to the naked eye by red spots on the leaves of plants, especially on wheat. By scientific researches made in Germany and other countries, it has been established that these spots are fungi, parts of which detach themselves in time, are carried away by wind, and will spread the disease when settling down.

Stable manure will, of course, contain more or less of these injurious matters. For this reason, stable manure ought to be little used in wheat-growing, and preference given to artificial manures. These contain a combination of acids that will weaken or even expel the rust.

This is so well known in Germany that no farmer in that country would think of raising wheat crops of stable manure, but they all apply artificial manures, among which the potash salts are foremost.

For beans, peas, hops, beets, potatoes, and the like, the quantity generally recommended is about 300 lbs., and the result will be pleasing and profitable. The yield, particularly of beets, was striking, and where the manufacture of beet-sugar is carried on the introduction of kainit to the beet farms will be productive of immence good, as its use will amply repay its cost. These farms may require more than the above quantity of kainit, as this crop exhausts potash from the soil in large quantities and very quickly.

For garden vegetables it seems, in many cases, that a larger quantity of kainit is recommended than the average needed for other growths, and the results excellent. In this connection we would like to call attention to the profit (pecuniarily) in its use on asparagus. Repeated experiments show that a rather large quantity was needed, and the asparagus grown were very large and of excellent quality. For cucumbers it is also particularly beneficial.

For fruit trees and berry vines, spread the kainit around the trees, &c., and rake the ground evenly and level. If too late to do it, or not convenient, the next best plan is to dig six to ten holes, say one to two feet deep, about one and a-half to three feet from the trees or vines, and pour the kainit in these holes.—*Kuhlow.*

EXPANSION AND CONTRACTION OF STEAM BOILERS.

ONE of the severest tests of the strength of a steam boiler is due to the unequal expansion and contraction of its different parts, owing to the effects of changes in its temperature. In the case of flue or tubular boilers, in which the flues or tubes are more directly exposed to the influence of heat than the shell, the strain thus developed is tremendous, the tubes or flues, or their material, expanding lengthwise with a force calculated to tear the heads out of the boiler. Where the flues are placed very near the bottom of a boiler, in which case the pressure is all on the lower side of the heads and the plates that keep them together, it is not unusual for these plates to be ruptured or the seams sprung underneath, causing troublesome and often dangerous leaks.

The smaller the proportion of the surface of a boiler that is exposed to the heat, the more active will be the effect of the expanding and contracting forces, and in the case of some boilers, set more than half exposed to the influence of the atmosphere, the tremendous power exercised by the expensive heat of the fire below and the contraction due to the low temperature above, are almost enough to tear the boiler to pieces.

It is the unequal expansion of shell and tubes, of the upper and the lower shell, that really does more injury to a steam boiler than the expansion and contraction due to changes in the pressure of steam; the leakage and cases of rupture that so often occur in the lower seams and along the bottom of horizontally fired boilers are unquestionably due to these causes, and in very many instances forced firing in getting up steam on first starting the boiler is to blame.

To avoid the injuries so often caused to boilers in this manner, it is necessary, therefore, to exercise great care in raising steam in new boilers or those that have been blown out and allowed to cool down.

The fire should be raised moderately and gradually and the boiler moderately filled with water, so that the increase in the temperature may be gradual. In cooling off a boiler the same care must be exercised. The plan adopted by some engineers, of turning a stream of cold water into the boiler as soon as it is emptied, cannot be too severely condemned, nor should the furnace doors be suddenly thrown open or any other proceeding taken that will result in suddenly lowering the boiler temperature, a rapid decrease in the heat being quite as bad for the safety and durability of the boiler as the moderate and unequal increase above referred to.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

JOSEPH AIRD, GREATBRIDGE.—Iron tubes and coils of all kinds.

ASHMORE, BENSON, PEASE AND CO., STOCKTON-ON-TEES.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

BLACKMAN VENTILATING CO., LONDON.—Fans, Air Propellers, Ventilating Machinery.

GEO. G. BLACKWELL, LIVERPOOL.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

BRUNNER, MOND AND CO., NORTHWICH.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

BUCKLEY BRICK AND TILE CO., BUCKLEY.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

CHADDERTON IRON WORKS CO., CHADDERTON.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. CLAY, EDINBURGH.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

CLAYTON ANILINE CO., CLAYTON.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

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R. DAGLISH AND CO., ST. HELENS.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

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R. & J. DEMPSTER, MANCHESTER.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

DOULTON AND CO., LAMBETH.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

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GALLOWAYS, LIMITED, MANCHESTER.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

JOHN A. GILBERT AND CO. LTD., LONDON.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

GRIMSHAW BROS., LIMITED, CLAYTON.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

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JOSEPH KERSHAW AND CO., HOLLINWOOD.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. LINDSEY AND CO., CLAYTON.—Lead Salts, (Acetate, Nitrate etc.) Sulphate of Copper, etc.

CHAS. LOWE AND CO., REDDISH.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

MANCHESTER ANILINE CO., MANCHESTER.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

MELDRUM BROS., MANCHESTER.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. MILNES AND BROTHER, BURY.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

MUSGRAVE AND CO., BELFAST.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

NEWCASTLE CHEMICAL WORKS COMPANY, LIMITED, NEWCASTLE-ON-TYNE.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

ROBINSON, COOKS, AND COMPANY, ST. HELENS.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. ROYLE, MANCHESTER.—Steam Reducing Valves.

A. SMITH, CLAYTON.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

WORTHINGTON PUMPING ENGINE COMPANY, LONDON.—Pumping Machinery. Speciality, their "Duplex" Pump.

JOSEPH WRIGHT AND COMPANY, TIPTON.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

Analytical Notes.

TO INCREASE THE SOLUBILITY OF TARTAR EMETIC.

ACCORDING to Kochlin (*Chem. Zeit.*) the solubility of tartar emetic is considerably increased by the addition of an alkaline chloride, such as common salt, or sal ammoniac. Thus, 5 parts of tartar emetic, if combined with an equal weight of salt, will require only 10 parts of water for solution.

TEST FOR CARBONATES IN WATER.

Schulze (*Chem. Zeit.*) has found that if a solution of lead chloride be added to potable water containing carbonic acid in combination, the water becomes milky. Free carbonic acid does not produce this effect. As small a proportion as 1 to 240,000 of the combined acid may thus be detected, while the chloride of barium test for free carbonic acid requires from 1 to 11, to 100.

A SIMPLE TEST FILTER.

In determining the end of a reaction in volumetric work it is sometimes necessary to filter a small portion of the liquid being titrated, and for this purpose sundry filter tubes have been devised, and are described in the ordinary text books. A notable simplification of these consists merely of a glass tube 25—30 cm. long, and about 5 mm. in diameter, having the lower end ground true. A little piece of filter-paper about 1 cm. square is moistened with a drop of water and stuck on the lower end of the tube, which is then immersed in the liquid to be tested; by sucking gently at the upper end some of the liquid is filtered through the paper-closed end and rises clear into the tube. The piece of paper itself may then be allowed to fall back into the bulk of the liquid, leaving a small quantity of filtered liquid in the tube, by which it may be removed for testing.—*Chem. Zeit.*

Official Memoranda.

(From the Board of Trade Journal.)

EXEMPTION OF SULPHATE OF COPPER FROM IMPORT DUTY IN SPAIN.

According to a despatch, dated the 2nd July, which has been received at the Foreign Office from Mr. W. A. C. Barrington, Her Majesty's Chargé d' Affaires at Madrid, the Madrid *Official Gazette* publishes a law of the Spanish Government providing that sulphate of copper may be imported into Spain free of duty, irrespective of the use to which it may be destined.

TUNISIAN PHOSPHATES OF LIME.

The following is an extract from a report by the Belgian Consul at Tunis, dated the 29th June last:—

The Mines Department of the Regency of Tunis has recently discovered the existence of beds of phosphates of lime in the mountainous region to the west of Gafsa, extending over a surface of about 50 kilometres.

The works recently undertaken have conclusively established the existence of phosphates in the regions of Djebel Limra, Seldja, and Stah, to the west of Gafsa, in large deposits, the workable thickness of which varies from 8 to 12 metres, over an extent of 50 kilometres. Analyses have shown that these deposits contain about 60 per cent. of tribasic phosphate, increased by about 3 to 5 per cent. by the washings. The total quantity of phosphates in this region may therefore be estimated at about 6 million tons, or about 5 million tons of washed ore, having a strength of at least 62 per cent. of tribasic phosphate of lime.

Other less important deposits are found in the mountains of Djebel Jellabia, Sehib, and Rofsa, to the south of Gafsa. This region is devoid of water, while to the west, for Limra, Seldja, and Stah, the river Selja supplies the water requisite for the preparation of the ore.

According to information obtained at Tunis, phosphates are worth about 60 francs (£2. 8s.) per ton.

The working of the deposits in question, to the west of Gafsa, would require the construction of a railway connecting them *viâ* Gafsa to the nearest seaport, called Skira. If this railway were constructed, the working of the phosphates, after deducting the expenses of extraction, washing, grinding, carriage, &c., would give a net profit of about 10 francs (8s.) per ton. The average annual extraction possible would reach 100,000 tons.

THE PROGRESS OF WYOMING.

The following is an extract from *Bradstreet's*:

In mineral wealth, Wyoming undoubtedly excels. Coal mining has, so far, received the most attention. Coal is found in every county, varying from two to 40 feet in thickness. The total production in 1888 was 1,512,936 short tons, worth, at the mines, 4,538,808 dols. One-third of this amount was expended for labour. The number of miners engaged was 1,527, who received at the rate of 90 cents to 1·10 dols. a ton for mining. The Union Pacific railroad has done the greater part of this work, monopolising it previous to 1886, but since then it has given outsiders a chance, and they have opened and developed a number of mines.

The soda deposits of the territory are of special interest, for soda has not hitherto been a natural product of the United States. The salt cake of commerce is produced in the eastern States, at a few places where salt is cheap, and sulphuric acid can be made as a by-product; but the larger amount is imported from England, where it is manufactured from common salt by treating with sulphuric acid and roasting. In Wyoming, all that has to be done, is to dig it out and dry it; and the territorial geologist says the deposits will amount to 52,000,000 tons. Last year, we imported about 150,000 tons of carbonate of soda (including sal soda and soda ash), valued at 2,900,827 dols., and in addition, bicarbonate of soda worth 19,912 dols, and caustic soda to the value of 1,300,851 dols.

It is further said, that Wyoming has iron ores of higher grade and purity than those found in Alabama, abundance of limestone to flux them, and, at easy distances, producing oil wells, ready to supply fuel for steel-making or other manufactures. Tin also gives great promise.

A recent Government estimate of the forest area of the territory is given in the Government reports as 7,718,400 acres, or about one-eighth of the whole territory, The forests are confined mainly to mountain ranges, between 4,500 and 10,000 feet above the sea level. Yellow and white pine, and white spruce prevail. The lumber is similar to the eastern spruce lumber, and is suitable for all building purposes except as a finishing lumber. It has too many knots to work smoothly.

CUSTOMS TARIFF OF NEW SOUTH WALES.

		£	s.	d.
Candles per lb., or reputed package of that weight, and so in proportion for any such reputed weight, and stearine		0	0	1
Cement	Brl.	0	2	0
Essences, flavouring, and fruit containing not more than 25% proof spirit	Gallon	0	4	0
Containing more than 25% of proof spirit		0	14	0
Glucose:				
Liquid and syrup	Cwt.	0	3	4
Solid		0	5	0
Iron:				
Galvanised, in bars, sheets, or corrugated	Ton	2	0	0
Iron and steel wire		1	0	0
Galvanised manufactures (except anchors)		3	0	0
Naphtha and gasoline	Gallon	0	0	6
Oils, except black cocoanut, sperm and palm		0	0	6
In bottle:				
Reputed quarts	Dozen	0	1	6
,, pints		0	0	9
,, half-pints or smaller sizes		0	0	6
Opium and any preparation or solution thereof not imported for use as a known medicine	Lb.	1	0	0
Paints and colours ground in oil	Cwt.	0	3	0
Varnish and lithographic varnishes	Gallon	0	2	0
Dynamite and lithofracteur	Lb.	0	0	1
Salt	Ton	1	0	0
Spirits:				
On all kinds of spirits imported into the colony, the strength of which can be ascertained by Sykes' hydrometer	Proof gallon	0	14	0
No allowance beyond 16·5 shall be made for the under proof of any spirits of a less hydrometer strength than 16·5 under proof.				
On all spirits and spirituous compounds imported into the colony, the strength of which cannot be ascertained by Sykes' hydrometer	Liquid gallon	0	14	0
Case spirits. Reputed contents of two, three, or four gallons shall be charged.				
Two gallons and under as two gallons.				
Over two gallons and not exceeding three, as three gallons.				
Over three gallons and not exceeding four, as four gallons.				
Methylated	Gallon	0	4	0
Perfumed spirits, perfumed water, Florida Water, and bay rum	Liquid gallon	0	15	0
Sheepwash	Lb.	0	0	3

MINERAL DEPOSITS IN CUBA.

The following is an extract from a recent report of the Consul-General at Havana :—

"The recent discoveries of mineral deposits in this island are of sufficient commercial importance to warrant my giving some further particulars concerning them.

"With the exception of copper, the existence of which was known to the aborigines and early Spanish settlers, no other metals were supposed to exist in appreciable quantities in Cuba.

"First, in 1880, iron in large quantities was known to exist in the mountains of the eastern provinces, and, in the following year, the first iron mines were reported and claimed, and the right of working 780 hectares obtained from the Government; the consequence of which was the subsequent discovery of many fields and lodes of rich iron, and manganese, and other metals, including some gold and asphalt.

"The Juruaga iron mines have now for six years been successfully worked with American capital, and recently another large group of similar mines has been bought by a Philadelphian syndicate, who have formed a company called the "Sigua Iron Company," to work them with a capital of 5,000,000 dols.

"The price paid is reported to be: 150,000 dols. cash, with a royalty of 30 c. silver per ton on the first 60,000 tons of ore extracted; 25 c. silver per ton on the next 40,000 tons; and 20 c. silver per ton on all the tonnage extracted over and above 100,000 tons, during the first year's working.

"Operations are to commence in October of the present year by the construction of a bridge and artificial harbour, and a railway thence to the mines.

"The analysis of the surface ore from one of these mines gave 28 per cent. of iron and 29 per cent of manganese (metallic). It is situated on the coast, and it is computed that the surface ore, and that known by borings to exist in the lodes, will give 6,000 tons monthly for the next 50 years.

"The cost of breaking the ore and its shipment to the States is calculated at from 6 to 8 dols. per ton, which, at current American prices, should leave a profit of 7 dols. per ton.

"Ten distinct groups of iron mines have been discovered and claimed for working, eight of which are for sale, the owners being too poor to work them.

"Two only have been sold, as stated above, to Americans, one of which gives 67 per cent. of pure iron. Some are reported to contain neither phosphorus nor sulphur; another is stated to have 500,000 tons of rich iron on the surface, without counting what is below it; and all are reported by native and American experts to be more or less extensive and valuable—some exceedingly so.

"All mines are exempt during 20 years from export duty and surface tax, and are allowed free import of coals. These exemptions, the facility of obtaining labour, the low rates of freight to the States, and the steady demand for iron, ought to facilitate and render profitable the working of these promising properties."—*No. 177, Foreign Office, Miscellaneous Series.*

THE SCOTCH OIL TRADE.

BUSINESS is somewhat quiet in the Scotch oil trade, and one or two products are not going off so readily as they could be wished. The burning oil question creates greatest interest in the trade. It is a little surprising to learn that during the recent Fair Holidays a firm required to bring in 30 barrels of Russian oil for the use of the "showmen" who visited Vinegar Hill and other haunts, and who would have no other product. It is stated that negotiations are proceeding between some of the larger dealers in paraffin oil for the purpose of concerting measures for importing petroleum oil from America and Russia to the Clyde. In explanation of this departure a correspondent writes :—"The action of the Scotch refiners makes this a necessity. Some three years ago, all the Scotch makers bound themselves together under a heavy penalty as an association to sell their oil in Scotland at one uniform price, leaving themselves free to sell in England and Ireland at the best price they could get. Recently some of the Scotch companies have been selling oil in some of the Midland towns in England at 5¼d. to 5½d. per gallon, while they dare not sell the same quality of oil in Glasgow under 6¾d., and the carriage to England will be at least 1d. per gallon, as against ¼d. to Glasgow. We have in recent years heard a great deal about boycotting in Ireland, but surely this is boycotting in Scotland with a vengeance, and must be fought. To sell goods out of the country where they are made at 20 per cent. less than in their own neighbourhood, and where the carriage is 300 per cent. more, is what the dealers in Scotland will not submit to. Foreign oil could be landed on the Broomielaw at or under 6d. per gallon, the quality being finer and sweeter in the smell than Scotch oil, which is just now 7d. per gallon in Glasgow.

NEW COAL-TAR COLOURS.

THE *Badische Anilin- und Sodafabrik* have brought out a new colour to be used as a substitute for archil. It is called *Azocarmin*, and takes very evenly. The colour comes upon the market in the form of a paste of golden scales. It is insoluble in cold water, soluble in hot water, with a red colour. In shade, it comes between fast red *D* and fuchsine *S*. It is dyed in a bath containing sulphuric acid, but the colour is not destroyed by an alkali, as is the case with acid fuchsine. The dyeing must be done in a wooden box, and the shade suffers from a tinned or copper vessel. *Carbazol Yellow and Cotton Yellow G.*—These colours furnish a beautiful, pure yellow, with more of a greenish tinge than that dyed with chrysamine. The properties of the yellows are similar to those of chrysamine. The following receipt is given for a heavy shade upon 100 lbs. of cotton :—Carbazol or cotton yellow G, 3 lbs., phosphate of soda, 10 lbs,, Marseilles soap, 2½ lbs., common salt, 20 lbs. Dye at a boiler for one hour, wash gently, and dry. Cotton yellow G is better adapted for printing purposes than carbazol yellow. The following receipt is given :—Dissolve 7½ parts of the colour in 400 parts of boiling water, and mix with 500 parts of 5 per cent. tragacanth paste, 50 of 20 per cent. white soap solution, and 50 parts of 20 per cent. sodium phosphate solution. After printing, dry and steam forty-five minutes without pressure.—*Die Chemische Industrie.—Chrome Violet.*—This colour is specially designed for printing in connection with other chrome colours. It is fixed by chromium acetate, is a very soluble colour, and should be made as below :—Chrome violet, 10-40 parts according to shade, water, 100 parts, thickening, 300 parts, then add 20-100 parts of acetate of chrome of 18°B. After printing, steam for one hour, wash, and soap. —*Chemiker-Zeitung.*

THE VOLUMETRIC ESTIMATION OF ZINC AND COPPER.

DONATH and Hathensaur have modified the process for titrating zinc with potassium ferrocyanide solution by carrying it out in a solution containing ammonium tartrate. They employ the ordinary commercial ferrocyanide, which is usually quite pure enough. One molecule of potassium ferrocyanide corresponds to two atoms of zinc.

$$K_4FeCy_6 + 3H_2O = 422{\cdot}4$$
$$Zn = 64{\cdot}9$$

The coefficient of the ferrocyanide solution can therefore be calculated from the amount of salt weighed out; *e.g.*, to obtain a solution of which 1 c.c. = 0·010 grm. Zn, 33·5 grms. of ferrocyanide must be dissolved in water and made up to 1 litre. It is, of course, also advisable to make an exact determination of its strength by means of a zinc solution of known strength.

The determination of zinc is then carried out in the following manner: Three or four grammes of the material to be examined are brought into solution, either by boiling with concentrated hydrochloric acid, a little nitric acid being added, or by aqua regia, and made up to a known volume with water, the insoluble gangue not being filtered off, but allowed to remain in the liquid. An aliquot portion of this well mixed solution is then taken, 20 or 25 c.c. of a concentrated solution of tartaric acid added to it, then ammonia added until the solution is faintly alkaline. The liquid is then heated to 80° C., and the ferrocyanide solution slowly added. A drop of the turbid liquid is from time to time brought on to a porcelain plate and mixed with a drop of glacial acetic acid. If the ferrocyanide solution is in excess a bluish colouration is produced. The occurrence of this end reaction is, of course, just as clear and easy to observe as in the titration of zinc solution containing ferric chloride by ferrocyanide. A large number of gravimetric estimations of zinc in various ores has shown a satisfactory agreement with the results obtained by this volumetric method. The authors have also endeavoured to apply this method to the determination of copper, but this can only be done when all excess of ammonia is avoided, and it is essential that the ferrocyanide solution be compared with a copper solution of known strength.

Since the determination of copper and zinc can be carried out under almost the same conditions by the same reagent, it becomes possible to estimate them both when they occur together in a solution, as in the analysis of brass.

In such a case, both metals are determined together in one portion of the solution by the method given above. Another portion is treated with iron filings, which precipitate the copper, and then the clear solution titrated as described above for zinc, the ferrous salt being first oxidized by a little nitric acid. The difference between the two titrations gives the ferrocyanide corresponding to the copper present, from which the amount of the latter can easily be calculated. — *Pharm. Central Halle.*

MULTIPLE EFFECT EVAPORATION.

IN the case of the Sugar Manufacturing Co. *v.* The Yaryan Manufacturing Co,, heard in the United States District Court. Eastern District, of Pennsylvania, the suit was for infringement of two patents, No. 341,669, dated May 11th, 1886, and No. 378,843, dated February 28th, 1888; granted to Mr. S. M. Lillie, the first being for "Improved apparatus for evaporating sugar solutions" and the second for "Vacuum apparatus for evaporating liquids." The defence was a denial of the validity of the patents, and a denial of infringement. Before Lillie invented his apparatus, the best apparatus for vacuum distillation was Mr. Yaryan's patented in 1884, which not being capable of successful application to sugar evaporating, Mr. Yaryan took out further patents in 1886 to remedy the defects of his previous apparatus. Mr. Lillie also took out the patent under consideration for a similar purpose in 1884. Mr. Yaryan followed with other patents. Judge Butler stated: "A comparison of the specifications and claims of Mr. Yaryan's application of 1886 (No. 355,259) with Lillie's, shows that the invention described in each (as respects the matter here involved), is substantially the same. Differences in form and construction of some of the parts of the apparatus, described in the two applications appear, but they seem to be immaterial as respects the subject of invention now under consideration. In principle, operation, and effect, the apparatus are, I think, the same to the extent here involved.

As to the points raised by the defence, the Judge considered that an affirmative answer seemed unavoidable in relation to the question "Is the patent valid?" The next question, "Has the respondent infringed?" he held the following opinion: "Looking at Lillie's specifications and claims and observing the variety in form and combination contemplated, it is, I think, reasonably clear that the devices used by the respondent infringe the patents under consideration. While there are mechanical differences the apparatus of the complainant and respondent, so far as respects these claims, seem to be the same in manner of combination, the elements embraced, mode of operation, and effect. It would be a waste of time to enter upon an analysis of the apparatus and point out the infringement more particularly. I think the substance of each claim involved is almost as readily seen in the respondents as in the complainants."

In the other patent sued upon—No. 378,843—the question of validity applied to claims 3, 4, and 6. It was pointed out that the "multiple-effect" process was old, and had long been practiced when this patent was applied for. Rillieux described, and applied it, in 1843, as was evident by his patent of that date. Alluding to Lillie's claims, Judge Butler was unable, after patient examination, to find any material distinction between Lillie's means of uniting several single-effect apparatus, with a view to the multiple-effect, and that employed by Rillieux. In construction, character, operation and effect, the means or devices employed seemed to be essentially the same. He held that "the first patent to Lillie embraces everything mentioned in them to which he is entitled. For the introduction of any of the matters covered by that patent unto the respondent's combined devices, it must answer in damages, as we have already determined. He cannot use them in any connection or combination whatever without the complainant's assent."

BRITTLE IRON.

IT is well known to artisans engaged in the working of wrought iron that if a piece of the very best and toughest iron is hammered out in the process of forging until it ceases to be red hot the effect of such cold hammering, as it is termed, is to cause the iron to become so brittle that it will in many cases break across in the process—or if it does not at that time this process of cold hammering so removes and destroys its tenacity as to render it capable of being broken with the slightest blow. In remarking upon this process, Mr. Nasmyth, the well-known authority, expressed the opinion that, though such a practice is by no means to be considered inherently wrong, but just the reverse, the evil rests in applying such a cold-hammered piece of forge work to its purpose without having passed through the curative process, which is simply to heat the piece of work in question to a dull red heat and lay it down to gradually cool. By subjecting wrought iron to the most violent hammering or compression at a low temperature, and then submitting the iron work so treated to the simple process referred to—heating red hot and slowly cooling—the tenacity or shock-sustaining qualities of the article are enhanced at least twenty times. In most cases, the process of hammering and swaging is necessary, in order to insure the requisite finish and fine surface, the forging so treated requiring, too, the least possible labour subsequently. *Mining and Scientific Press.*

VALUE OF SELF-FLUXING ORES.

IN a communication to a contemporary, S. A. Richards, of Chicago, writes the following relative to the value of self-fluxing ores:

It has been claimed that an ore low in iron cannot be carried any distance and compete with ores high in iron. To a certain extent this is true, and especially so if there is not much difference in the cost of fuel, but the composition of the gangue must surely be taken into account when estimating the value of an ore. The price advances according to the units of metallic iron in the ore, and if very high in iron the cost often far exceeds its relative value with ores containing less iron. In the following article the writer proposes to show his reasons for making this statement. All the ores to which reference will be made are from the Lake Superior district.

In the calculations, phosphorus will not be taken into consideration. The intention is simply to show the difference in the value of ores according to their gangue in producing an iron suitable for mill, open-hearth basic or foundry purposes. In the case of low phosphorus ores the purchaser often pays a fancy price for an ore that meets his requirements, hence the ores will be dealt with according to the cost of producing iron, assuming the phosphorus in no case to be excessive. The following analyses are of ores the most of which are well known and extensively used, and, being either in or nearly within the Bessemer limit, bring a good price in the market. Not wishing to name the ores, they will be designated by numbers:

	Iron (metallic).	Manganese.	Silica.	Alumina.	Lime.	Magnesia.
1.....	60·37	0·54	7·10	2·95	0·25	0·19
2.....	61·10	0·96	7·80	0·43	0·36	0·14
3.....	60·17	0·92	7·85	2·46	0·25	0·11
4.....	58·00	0·41	14·17	1·43	0·34	0·29
5.....	58·10	0·39	14·10	1·00	0·45	0·07
6.....	61·00	0·11	9·00	1·10	0·75	1·06
7.....	56·80	0·04	9·95	2·26	0·45	0·97
8.....	54·46	0·27	17·06	0·11	1·59	0·99
9.....	54·20	0·75	2·80	0·95	7·05	3·61

Calculations based on the composition of the gangue in the foregoing ores, deducting moisture in each case, show that the quantity of material required to produce a gross ton of pig iron will be as follows:

	Ore, pounds.	Lime, pounds.	Coke, pounds.
1.....	3,930	1,180	2,320
2.....	3,870	1,190	2,290
3.....	3,930	1,220	2,330
4.....	4,070	2,030	2,640
5.....	4,070	2,030	2,640
6.....	3,860	1,350	2,340
7.....	4,150	1,600	2,570
8.....	4,300	2,900	3,000
9.....	4,190	....	2,200

The price this season of the ore numbered 9 has been $1·90 at the mines, or 3½ cents per unit for the contents of metallic iron, which is much below the price at which most of the ores have been sold. The unit of iron is a common way of estimating the value of one ore as compared with another, but taking into consideration the results shown above, as to the material required to make a ton of pig iron, and calculating values on the basis of the present market value of No. 9, the cost of ore per ton should be about as follows at the points named, of course additional freights to destination:

	Chicago.	Mahoning and Shenango Valleys.
1	$3·85	$4·75
2	3·90	4·80
3	3·85	4·75
4	3·80	4·70
5	3·80	4·70
6	3·90	4·80
7	3·75	4·65
8	3·65	4·55
9	3·65	4·55

Figuring the cost of coke at Chicago at 5 dols. per ton and in the valleys at 3 dols. while the limestone is assumed to be 70 cents at a points, the cost of material per ton of pig iron would be as follows:—

	Chicago.	The Valleys.
1	$12·96	$12·22
2	12·88	12·23
3	12·98	12·25
4	14·20	13·21
5	14·20	13·21
6	13·05	12·35
7	13·94	13·05
8	15·53	14·66
9	12·32	11·81

From these calculations it will be seen that, notwithstanding the comparative poorness of No. 9, pig iron will be made from it at lower cost than from the much richer ores. Nos. 4, 5, and 8, being high in silica, are the dearest ores in the series selected for illustration.

In cases where very rich ore is used a poorer ore with more silica is generally worked with it in order to produce the proper flux. Now, when the rich and poor ores are mixed together with the proper amount of lime to flux them, the whole simply forms a self-fluxing mixture. The question then arises, Will this mixture, at the price paid for it, make as cheap an iron as an ore lower in iron but self-fluxing, when the prices at which they can be bought are taken into consideration? As a general rule it will not, for usually the self-fluxing ores and those nearest approaching this condition are high in phosphorus, and their market price is lower per unit of iron than those carrying less phosphorus. It has been pretty well demonstrated that the phosphorous occurs in the gangue, and not in the iron oxide. This being the case, it would be only natural to suppose that a gangue composed largely of lime would carry more phosphorus than silica (i.e., phosphate of lime). For instance, No. 8, which shows very high silica, contains on an average only 0·04 per cent. of phosphorus, while No. 9, which is very low in silica but high in lime, carries on an average 0·05 per cent. of phosphorus. For Bessemer purposes the self-fluxing ores can rarely be used. For open-hearth basic, mill and foundry irons, as above shown, they are much more economical. The time is not far distant when the open-hearth basic furnace will supersede the puddling furnace, and mild steel will almost entirely take the place of wrought iron. The question will then arise, Which are the most profitable ores to use when the phosphorus in the pig iron cuts but a little figure?—*American Manufacturer.*

GLYCERINE AS A WOOL FIBRE PRESERVER

MR. J. Perzog, a distinguished French analytical chemist, has discovered a new process of retaining the durability and original resistance of wool thread and wool tissues, in cases in which the latter have to be exposed to a heat of 130 or 140 degrees Celsius for manufacturing purposes. At 110 degrees Celsius, neither wood nor woollens alter. When, however, heated to 130 or 140 degrees Celsius, both turn yellow, and seem to haue undergone combustion. To make wool tissues water-proof, manufacturers have to expose the fabric to 130 or even 140 degrees Celsius, and it was invariably found that the impregnated tissue had lost all its resistence. It was first thought that certain wools would alter less than others. This, however, proved erroneous, and it and it was found that all the different fabrics, on which the experiment was tried, showed combustion, to a certain extent, on account of the wool not being able to retain a necessary degree of humidity under the exposure to so intense a heat. Glycerine is known as a substance which greatly prevents evaporation of humidity, and, based thereon, Mr. Perzog saturated several woollen tissues with a solution containing 10 per cent. of glycerine. The experiment proved absolutely successful. The fabrics in question show not the slightest alteration, and had retained 13 per cent. of glycerine, after having been exposed to 140 degrees Celsius. The preservation of the wool fibre is thus assured, and once more science has helped manufacturers of waterproof fabrics over one of the greatest difficulties they have had to deal with hitherto.—*Journal of Fabrics.*

SACCHARINE v. SUGAR.

WE learn from several French consular reports that saccharine threatens to compete seriously with cane and beetroot sugar both in France and in the neighbouring markets. Hitherto the comparatively high price of this product has prevented it from becoming popular, but the situation in this respect has changed of late. It appears that the current price of saccharine, which a short time back was 136 francs per kilogramme, has now fallen considerably. By mixing it with glucose the price is reduced still further, and in this form it is beginning to be used extensively in the preparation of confectionery, syrups, and liquors. This state of things is likely to compromise severely the French sugar industry, and at the same time to diminish the treasury receipts. From the point of view of the customs, saccharine comes under the category of "chemical products, not otherwise specified, derived from coal tar." These are not at present included in any treaty of commerce. It would therefore be easy either to exclude them entirely or to tax them to any desirable limit. Doctors are of opinion that saccharine and similar preparations should be banished from articles of food as being indigestible and containing no nourishment. Under these circumstances the French Government is inclined to prohibit the importation not only of saccharine but of all substances containing saccharine matter.—*Kuhlow.*

OILCLOTH.

THE body of oilcloth is what is called burlaps, made of jute and imported from Scotland. This coarsely woven fabric is limp, and is stiffened by being passed through a mixture of starch and glue and over hot rollers, coming out, it might be said, laundried. It is then ready for the paint machine, where it is given the body. There are four qualities of oilcloth, depending on the number of body coats of paint. That which is to be the best quality receives five or six coats; the poorer grades, a less number. The cloth, in pieces 25 yards long by two yards wide, is dried in racks which are constructed in tiers of twenty. The factory has a rack capacity of 11,000 square yards. The thickness of each coat of paint is governed by a steel knife, in manipulating which a workman becomes so proficient that he can tell nearly to the pound what a piece of cloth will weigh when the coating process is completed. Three men at a paint machine can turn out in a day one hundred pieces containing fifty square yards each. The operation of coating the first quality cloth occupies a week, as each coat requires twenty-four hours in which to dry. It is then sent to the rubbing machine, where surfaces coated with glue and sand pass rapidly over the side which is to be printed, ridding it of all irregularities The better qualities are afterwards given another coat of paint, when they are ready for the printers. This is the most interesting part of the operation. For every colour in the pattern to be transferred to the oilcloth there must be a block. These blocks come from Maine. They are about two inches thick, two feet square, and are composed of several layers of wood. The surface to be used is of maple, crossed and recrossed by narrow grooves, which form a surface of small squares, 144 of them to the square inch. Those squares look like, and are in reality, so many pegs. Where the pattern is desired to show, the pegs are left standing, those on the portion of the surface which is not to be printed from being cut away. The styles in pattern change twice a year. Some are designed in Utica, and others come from Philadelphia and New York. Some patterns containing many colours require from twenty-five to thirty blocks, and consequently that number of impressions, to reproduce the design. Rug patterns are the most difficult to make, as it requires different blocks for the corners, sides, and the centre. The printing is done on the top flour, so that the oilcloth can hang for a distance of fifty feet to dry. Each printer has a table with eight pads, on which he smears his colours. Pressing a block to the pad containing the required colour, he transfers it to the surface of the cloth, using hand pressure only. Having done this with every block, as each transfers but one colour, and consequently but a small portion of the complete design, he has finished about four feet square of printing, and goes about repeating the operation on another portion of cloth, and so on. Two men generally work at a table, and can turn out from 100 to 150 square yards of oilcloth a day, when printing seven or eight colour patterns. The paint used is similar to the ordinary house paint. When the printing is completed, another block is pressed on, which gives the embossed surface, of which there are two kinds, pin and line finish. The wet cloth then hangs from the loft for a week, when by an ingenious mechanism it is transferred to the drying room, where for another week it remains in a temperature of 130 degrees. The door to this dry room is fifty feet high, allowing that length of oilcloth to be passed through without rolling or bending. Coming out, it is varnished, three men, with the aid of a machine, varnishing 6,000 yards a day. Next it is trimmed and the cloth is ready to be shipped.—*American Analyst.*

DISCOVERY OF NOVEL PROPERTIES IN CAST IRON.

SOME specimens of cast iron which exhibit unusual properties, produced at one of the great stove manufactories in Albany, New York, have excited much interest, the pieces of metal being about 1 inch in width, ⅛ inch in thickness, and some 15 or 18 inches in length. Of these strips, some were twisted so as to form spirals, and others were wrapped upon coils. That cast iron can be made very tough, and even a certain amount of elasticity be imparted to it, is of course well known, but it is unusual, if not unprecedented, for any metal employed in stove foundries to bear such tests as those thus indicated. The twisting and bending in this case were done hot, there being nothing in the specimens but a judicious admixture of good irons and the absence of old scrap—the fact being also stated that the irons in question represent the daily meltings of the foundry from which they came, all the stoves produced there having their plates of the same metal which exhibits this peculiar toughness. It is not asserted that, because the metal will bear a torsional strain of the kind described, it is, therefore, unbreakable, there being, of course, a limit to its remarkable elasticity.

Correspondence.

ANSWERS TO CORRESPONDENTS.

W.U.—"A Technical Treatise on Soap and Candles," by R. S. Cristiani; 8 vo. Henry Carey Baird and Co., Philadelphia, will probably suit you.

Young Analyst.—(1). You must boil off the ammonia, and wash the precipitate by decantation. (2). Fresenius, decidedly.

M.M.—We regret that we have no space to devote to the subject; try one of the local papers in your district.

J.G. y Ll., (Madrid)—About thirty-eight francs free on board in the Tyne. Better not to make it yourself.

E.T.H.—The Bill was thrown out.

D.—Consult a solicitor, the Alkali Acts do not include brick-kilns.

Bostonian (U.S.A.)—We cannot break our rule. If your letter appears it must be in our advertisement columns.

Alkali.—Of course it will rust; all standing iron machinery rusts when neglected. Try tallow and plumbago.

Novel.—No not *novel*, it has been the subject of quite half-a-dozen patents.

Aluminium.—A *bright* process for electro-depositing aluminium is not, we believe, at present known.

Yellow.—The yellow smoke to which you refer is very probably due to the manufacture of nitrate of iron. Write to the Local Government Board, Whitehall, if you deem it sufficiently important.

Petrolio.—Your suggestions shall have due consideration; we think your fears on the other matter are groundless.

Grim.—"White blacking" is a curious expression, but satin white, which admits of a certain amount of gloss is perhaps what you are seeking.

G.G.G., Amperemeter, Noxious.—Your letters are only suitable for advertisements.

Merchant—We should be glad to have the information; we are always obliged to our readers for news, re trade developments, and new processes.

*** *We do not hold ourselves responsible for the opinions expressed by our correspondents.*

DRUGGISTS AS ANALYSTS.

To the Editor of the Chemical Trade Journal.

Sir.—I enclose you an advertisement taken from a soda water bottle—not for publication, I need hardly say, but as an example of a druggist who has recently begun to advertise himself as an analyst.

Where is this sort of thing going to end? I believe if the matter were inquired into, that the name of analyst was called into existence to distinguish the scientific chemist from the dispenser of medicines, but now it appears that not only the name of the analyst's profession is being usurped, but also a large share of his emoluments is being turned into other channels.

Under the circumstances, it appears to me very plainly, the duty of the Institute of Chemistry—a chartered body of scientific chemists—to place its Fellows on such a legal footing, that their domain cannot be invaded with impunity, even if it spends every penny of its funds in doing it. Otherwise, every fledgling who becomes a qualified dispenser of drugs, will begin to dub himself analyst, and the name of Fellow of the Institute will be no protection with an undiscerning public, against the competition of those who can advertise themselves for nothing on a thousand articles they sell over the counter.—I am yours, etc.,

Vigilant.

Trade Notes.

The Chemical Union.—It is said that the Constructive Committee have fixed the minimum prices for next year's contracts at the following figures:—Bleach, £6.; 70% caustic, £10. 10s.; muriatic acid, 10d. per carboy.

Woodhouse and Rawson United, Limited.—We have pleasure in stating that Messrs. Woodhouse and Rawson have just been awarded a Silver Medal for their show at the Exhibition of Fire and Life Saving Apparatus, at Amsterdam.

Jamaica Industrial and Manufacturing Exhibition.—It is announced that the above exhibition will be opened in Jamaica, on January 27th, 1891, under the patronage of H.R.H. the Prince of Wales. The object of the exhibition is to draw attention to the products of Jamaica, and the resources of the island as a tropical possession of the British Crown.

Discovery of Coal in Austria.—At the Silesian village of Roy, near Karwin, extensive beds of coal have been discovered. An English company, which had obtained the right of searching for mines, began its operations some months ago, and has now discovered immense layers of coal. A mine is to be established, and the English engineers are already taking measurements and preparing the plant.

Phosphorus Manufacture.—Messrs. Ellwell, Parker and Co. are building a large phosphorus factory in the Black Country, and are about to produce this element by a process recently patented by Mr. Parker in conjunction with Mr. A. E. Robinson, of Birmingham.

New South Wales: its Mineral Wealth, History, and Resources.—This interesting handbook, prepared for circulation in the New South Wales Court of the International Exhibition of Mining and Metallurgy, contains much useful information in a concise form upon the history, development, and resources of the Colony of New South Wales.

Ink for Copying without Pressure.—Haldane gives the following formula for the preparation of a black ink, which he states will give sharp copies without the aid of a press:—Take of

Extract of logwood	1 oz.
Sodium carbonate, crystals	2 drs.
Neutral potassium chromate	15 grs.
Gum Acacia	2 drs.
Glycerine	1 oz.
Distilled water	a sufficient quantity.

Place the extract, in coarse powder, in a porcelain capsule with the sodium carbonate, add eight fluid ounces of distilled water, and heat until the extract is all dissolved and the solution acquires a deep red colour. Remove from the heat and add the glycerine, and then the chromate and the acacia, each previously separately dissolved in a little water.

An American Patent for Bleach and Caustic.—A new method of making bleaching powder and caustic soda is the subject of an American patent. In this process salt is first treated in a heated still with nitric acid, whereby nitrate of soda and the gases nitrosyl chloride and chlorine are formed. These gases are passed through a vessel containing nitric acid and manganese oxide, when nitrate of manganese and chlorine are obtained. The latter is converted into bleaching powder in the usual way. The nitrate of manganese is heated, when it splits up into nitric acid and manganese, both of which can be used again. The nitrate of soda formed in the first stage is furnaced with oxide of iron, when nitric acid and caustic soda are formed.

Naphtha in the Caucasus.—Although the occurence of naphtha in the territory situated between the Sundsha river and the main mountain range of the Caucasus east of Wladikawkas has been known for some time, borings have only been commenced recently by a number of local capitalists, the initiative in this direction having been taken by General Panin. In 1888 the average daily yield of crude oils amounted to 150 puds per well; in 1889, after deepening, it rose to 300 puds, and at the present time, the depths of the wells having been still further increased, the yield may be put down at 600 puds. The crude oil has a colour ranging from dark brown to black. The specific gravity is 0·886, and on distillation, the oil yields from three to four per cent. of petroleum spirit, of 0·700 specific gravity, and from 20 to 25 per cent. of kerosene, which has a flashing point of 25 degrees.

Harrogate and Water-gas.—Harrogate is the first town in England to use the new illuminant, water-gas. Parliament-street is now lighted by means of gas manufactured from water. Plant has been laid down which is sufficient to supply all the main streets of the borough. The water gas is made at the rate of 1,000 ft. in three minutes. The Mayor (Mr. Samson Fox) has laid down the plant and a main and pillars on both sides of the street at his own expense entirely. The lamps are placed at intervals along the street, and at the junction of James-street a large 200 candle power lamp is fixed. In this there are twenty-four jets, but the lamp is capable of giving an illuminating power of 800 candles if necessary. The light from the water-gas is undoubtedly a decided improvement upon the ordinary gaslight, so far as illumination goes, and it is absolutely free from smoke and soot. As to the cost, it is a means of saving some 60 per cent., and it burns perfectly clean, and makes no sticky deposit in the cylinder.

Preserving Lard.—Some experiments have recently been undertaken by Mr. James L. Demoville, Ph.D., in order to ascertain the relative advantages of certain preservatives. He finds that the alum process for preserving lard is all that can be desired. In this process the lard is melted and a little finely powdered alum carefully and gradually stirred in. Whilst still hot the lard is strained, and is then allowed to cool. As soon as it has regained its usual consistency it is turned out upon an inclined slab of slate or other suitable material; here it is well worked with a muller whilst a stream of water is allowed to trickle over it. It is then ready for packing. Experiments were also made with gum benzoin, balm of Gilead buds, storax, salicylic acid, rectified turpentine, and balsam of tolu; and of these the best results were obtained by using 1% of balsam of tolu. The lard thus obtained was white, firm, and kept well. Its peculiar odour was well marked by the slight but pleasant odour of the balsam.—*Oil, Paint and Drug Reporter.*

AMMONIA IN CANADA.—Ammonia manufacturers in Canada have combined to put up the price of their product, and have succeeded so far that the initial advance has been from 5¼ to 8 cents per lb.

TWO INDAMINE BLUES.—There are at present two indamine blues on the market, one of which is sold in the form of a powder, and the other in paste. Both are derivatives of induline, and both are basic colours, although there are certain minor points of difference between them. It is unfortunate to have the same name for different products.

THE PROPOSED CHEMICAL UNION.—The statement that a Chemical Union is an accomplished fact is incorrect. It will be remembered that similar statements were made with regard to the projected paper syndicate, which, under pressure of organized opposition, collapsed about a year ago. The present scheme is giving rise to precisely similar counter movements. The formation of a Chemical Union would be the signal for a combination amongst the paper consumers with the object of re-opening, on the co-operative principle, some of the many chemical works now lying idle.—*Times.*

THE SCOTCH MINERAL OIL TRADE.—At a recent meeting of the Scotch Mineral Oil Companies, it was unanimously resolved to reduce the price of burning oil for the ensuing season by one halfpenny per gallon on last year's figure. The competition between the American and Russian producers is maintained as keenly as ever. and there is no apparent prospect of it coming to an early end. From Pittsburgh it is reported that the one subject of speculative interest is the proposed listing of Lima oil, of which there appears to be 20,000,000 gallons in the hands of the Standard Company. The quantity of other oil above ground is so small that no room, it is said, remains for the free speculator, whose requirements are likely to be met by the creation of Lima certificates. The Standard Company, it is stated, has consented to the arrangement because it is no small item that the storage charges should be borne by some one else than themselves, as it means 25c. a day for every 1,000 barrels of oil carried by the public.

LARD AND CAUSTIC SODA—Geo. Ludlow, twenty-three years old, an employé in Wilcox and Co.'s lard manufactory at Guttenburg, N.J., fell into a vat of caustic soda. His cries of agony attracted another employé named Yaers, who, in attempting to rescue Ludlow, also fell into the vat. The cries of both men brought a number of workmen to the vat. Ludlow and Yaers were rescued after they had been in the vat about five minutes. It is thought that both men will die. As there is but one legitimate use for caustic soda in lard refining—that for cleansing, and as a vatful cannot be needed—it follows that caustic soda in this factory must have been employed for bleaching the lard. The consequence of this would be to add a weighty and harmful adulterant. A pertinent query is, how much caustic soda is left in the finished lard to make weight, save labour and expense of washing it out, and make the lard injurious to health?—*American Analyst.*

BRUNNER, MOND AND CO., LTD.—The report was submitted at the 19th half-yearly ordinary general meeting on the 18th inst., at the Law Association-rooms, Cook-st., Liverpool, Mr. John Crosfield, J.P., of Warrington, presiding. We may state that the balance-sheet and profit and loss account showed a balance on the working of the half-year ended on 30th June last of £129,691. 19s. 1d., which, with the amount of £13,305. 16s. 11d. brought forward from the previous half-year, made a total of £142,997. 16s. The directors proposed to deal with the above balance as follows:—Dividend on the preference capital at 7 per cent. per annum, £12,035. 6s. 9d.; dividend on the ordinary capital at 30 per cent. per annum, £88,125.; amount to be written off patents account, £2,500.; amount to be placed to suspense account, £20,000.; balance to be carried forward, £20,337. 9s. 3d. The Chairman proposed the acceptance of the directors' report and statement of accounts, and the payment of dividend in accordance with the directors' recommendation. Mr. C. J. Galloway, Manchester, seconded the resolution, which was unanimously adopted. Before the close of the meeting Mr. J. T. Brunner, M.P., moved that Mr. Thomas Hungerford Forgan, who has been secretary of the company since its formation in 1881, be elected a director of the company, and it having been seconded by Mr. C. J. Galloway, was unanimously agreed to.

A FUEL ECONOMISER.

A RECENT improvement in the use of steam power has attracted some attention in view of the very considerable saving effected by it in fuel. In an ordinary tubular boiler the water lowers the temperature of the fire, and each time fresh water is forced in additional lowering follows—so, too, on the door being opened to allow fresh fuel to be added, the temperature becomes lowered, a quantity of gases being thus forced to pass off unconsumed. To overcome this the plan now brought forward is to build a brick arch over the fire so that the boiler is heated by radiation instead of by the direct blaze, the bricks, which become white, not acting as a reservoir of heat, and keeping the temperature at a high pitch—a fierce fire produced with a saving of at least 20% of fuel. In one instance, where the arrangement is applied to a plant of boilers (with no fuel but coal screenings and a small quantity of wet sawdust) steam is supplied for seven engines, which run 1,200 feet of shafting, the steam being carried a distance of 900 feet to the different establishments, and in order to do this the steam must be intensely dry. No blower is required on the boilers, as would be necessary without this attachment. And it appears that at the rolling mill on one boiler where it was customary to use 12 tons of coal a week, after adding the arch only 8 were required, there being a saving of 4 tons.—*Exchange.*

Market Reports.

THE TYNE CHEMICAL REPORT.

TUESDAY.

Chemicals have not shown much variation in prices this week, but the market on the whole has continued firm. The combination prices have not so far affected quotations for prompt delivery. Bleaching powder is still weak,and price has slightly declined. Caustic crystals, soda ash, and sulphate are practically the same as last week. Owing to the increasing demand for hyposulphite of soda, makers have advanced the price ten shillings per ton. Chemicals are now quoted for delivery over the last quarter of this year and the whole of next. Bleaching powder is quoted £6. Oct.-Dec., and £6. 5s. for 1891; soda crystals, £2. 16s. 6d., Oct.-Dec., and £3. 5s. for 1891; soda ash, 1⅜d. per degree, less 5% Oct.-Dec., and 1⅜d. per degree less 3½% 1891; sulphate of soda, 40s. per ton Oct.-Dec., and 45s. per ton over 1891; caustic soda, 77%, and chlorate of potash quoted for October to December, at £10. 10s. per ton and 5½d. per lb. respectively.

For prompt shipments to-day's quotations are—Bleaching powder, in softwood casks, £5. 3s. 9d. to £5. 5s. per ton; hardwood casks, £5. 7s. 6d. to £5. 10s. per ton; caustic soda, 77%, £10. 10s. per ton; ground and packed in 3-4 cwt. barrels, £13. 10s. per ton; soda ash, 48/52%, 1⅜d. per degree less 5% to 7%; soda crystals, 55s. 6d. to 56s. 6d. per ton; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 41s. per ton; recovered sulphur, rock, in bags, £4. 3s. 6d. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

Manufacturing coals have now eased down to about the price they were quoted previous to the stoppage of coal shipments in South Wales. The market is firm, and the demand good. Northumberland steam small, quoted from 7s. to 7s. 6d. per ton, and Durham small 7s. 6d. to 8s. per ton.

MISCELLANEOUS CHEMICAL MARKET.

Business continues brisk in the alkali trade, and all prices have a firmer tendency. Bleaching powder has realized £5. 12s. 6d. to £5. 15s. per ton, on rails, for prompt and early deliveries, and for delivery over 1891, some transactions have been closed at £6. per ton. The Committee of the "Chemical Union" now practically contract prices, and with the issue of the prospectus, which will be laid before the public at an early date, an increased demand for future deliveries of of goods may be looked for from those who at present look upon the scheme with a certain amount of scepticism. Soda ash is steady at 1¼d. per deg. for the present year's deliveries. Soda crystals are scarce for early deliveries, and prices have advanced to £3. 5s. f.o.b., Liverpool. Caustic soda has been in strong demand and further rise in prices has taken place, 70% now being at £10. 5s. per ton, f.o.b., and other strengths at corresponding values. Little or no business has been done for 1891, at the comparatively high figure fixed by the Union, viz., £10. 10s., free on rails, and it is hardly probable that this price can be maintained. Muriatic acid at 10d. per carboy is also generally felt to be an impracticable figure, when carriage costs to the principle consuming districts are added. Sulphur is selling freely at £4. 2s. 6d. per ton, on rails. Chlorate of potash, firm at 5d. per lb. Sulphate of copper, quiet, and nominally unchanged in price. Citric and tartaric acids, dearer. Oxalic acid, quiet, and prices unchanged at 3⅝d. per lb. Yellow prussiate of potash remains firm, and is in good demand for prompt and forward delivery. Caustic potash and carbonate continue in good demand. Acetates of lime, steady in price, but only in limited demand. Acetic acids, dull, and prices unchanged. Acetate of soda, rather dearer.

TAR AND AMMONIA PRODUCTS.

The benzol market is exceedingly firm, and business in 90s. has been reported for forward delivery up to 4s. 3d. per gallon; 50/90s. are also in good demand, and are worth 3s. 2d. per gallon. The solvent naphtha market is rather more quiet, but still a good business is being done. Creosote remains in the same condition as reported last week, while in anthracene there is a very strong market indeed. Anything offering at 1s. 4d. in 30% A, or at 1s. 1d. in 30s. B, can easily be disposed of. The pitch market remains quiet and without alteration.

The sulphate of ammonia market has continued very strong, and with further American orders, £11. 15s. has been reached at Liverpool for the best makes. At Hull, there are buyers at £11. 12s. 6d., and Leith is again quoted at £11. 10s. to £11. 11s. 3d. At the close there seems to be a lull, so far as the American demand is concerned, but the Continent is waking up, and the requirements from the latter quarter may more than counterbalance the diminution of American orders. Beckton price is £11. 12s. 6d., while outside London makes are fetching the same price, and makers are asking still higher. In fact, the market may be said to close at £11. 12s. 6d. at all ports, with a tendency to rise.

REPORT ON MANURE MATERIAL.

There has been a good business passing both in phosphatic and nitrogenous material, at hardening prices all round, except for some kinds of mineral phosphates.

Quotations for Charleston land and river rock remain without change, but very firm, sellers being unable to undertake any large obligations unless for shipment a good way ahead. Prices of Canadian, Somme, and Belgian remain as last quoted, but for Canadian the position is distinctly firmer.

Several further cargoes of River Plate bones have been sold at £5. 10s., which price would still readily be paid, but sellers now require £5. 12s. 6d. in any position. At the moment shippers of crushed East Indian bones seem to be off the market, £5. 10s. having been refused, and a much higher price being now named. After sale of several hundred tons Bombay meal at Liverpool at £5. 10s. ex-store the price has been advanced to £5. 15s., and it is doubtful whether less would be accepted, for fair average quality, shipment ahead. Parcels of good common grinding bones are worth £5. to £5. 2s. 6d. ex-quay Liverpool.

Several due cargoes of nitrate of soda were sold about a week ago at 8s. 3d., since when the market has advanced to 8s. 4½d. for handy cargoes, and about 8s. 4¼d. for large ones. 8s. 9d. would have to be paid for September-October or October-November shipment. Spot has advanced to 8s. 4½d. for ordinary quality, and 8s. 6d. for refined.

Further business has been done in home prepared dried blood, but prices do not transpire. The value for prompt must be quoted 10s. 3d. to 10s. 6d., according to position of works, delivered free to rails. We do not hear of any further business in ground hoof.

Manufacturers of supers, in face of dear phosphates, are shy of quoting unless at full prices. We should call nearest value about 50s., in bulk, f.o.r. at works.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron rose 6d. to 9d. Scotch warrants closing at 49s. 10d. cash, and 50s. 1d. one month. Middlesbrough warrants at 46s. 9d. cash, and hematite warrants at 57s. 7½d. cash. Copper was firm; Chili bars, G.M.B.'s and G.O.B.'s closing at £59. to £59. 7s. 6d. cash, and £59. 10s. to £59 17s. 6d. three months. Tin was steady; Straits, closing at £95. 10s. to £96. cash, and £96. to £96. 10s. three months; Australian £95. 12s. 6d. to £96. 2s. 6d. cash. Lead, Spanish, £12. 17s. 6d.; English, £13. to £13. 2s. 6d. Spelter, Silesian ordinary, £23. 12s. 6d. to £23. 15s. Quicksilver, £10. 5s. first hands, £10. second.

GLASGOW, Wednesday.—The pig-iron market opened irregular this morning, a good business being done at 49s. 2½d., 48s. 10½d., to 49s. 7½d. cash, and 49s. 6d., 49s. 1½d. to 49s. 10d., one month buyers at noon at 49s. 7½d., cash, sellers ½d. per ton dearer. In the afternoon a strong feeling prevailed, and a moderate business was done at 49s. 9d., 49s. 10d., 49s. 5½d., 49s. 11½d., to 49s. 11d. cash, and 50s., 49s. 9d., to 50s. 2d. one month; closing buyers at 49s. 11d. cash, sellers ½d. per ton more. Middlesbrough warrants were quoted buyers at 46s. 9d. cash, sellers 47s. Hematites were done at 57s. 6d. to 57s. 9d. cash, and 57s. 9d., 57s. 7½d. to 58s. 1d. one month, closing buyers at 57s. 8½d. cash, sellers 57s. 9d.

WOLVERHAMPTON, Wednesday.—Following the northern markets, the Staffordshire iron trade is improving. Finished iron is in better request both for home and export, some good orders having been taken for South America and India, and a better business is registered for tank plates and hoops. Prices are firm at £8. 10s. for best bar iron, and common bars are quoted at £6. 10s. to £7. Galvanizers' sheets are dearer at £7. 15s. to £8. for doubles. An increased trade is moving in puddled bars. Brisker inquiries and heavier deliveries are recorded in pig iron; and to complete current contracts makers are reducing stocks. Minerals and coal are in moderately active sale.

THE LIVERPOOL MINERAL MARKET.

The firmness reported in this market last week has been well maintained. Manganese: Arrivals still small, and prices remain firm. Magnesite: On account of very heavy stocks prices are totally in the hands of buyers; raw ground, £6. 10s., and calcined ground, £10. to £11. Bauxite (Irish Hill brand): The demand continues strongly to increase, and prices are very firm; Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: Arrivals have been somewhat larger; the demand, however, is strong, and prices are well maintained, especially for G.G.B. "Angel White" brand, 95s. to 100s. medium, 105s. to 110s. superfine. Barytes (carbonate): The production has increased, prices, therefore, somewhat easier; selected crystal lump scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; selected crystal ground, £8. Sulphate: The production of best white has decreased, making prices firmer; best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.G.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumicestone steady; ground at £10., and specially selected lump, finest quality, £13. Iron ore easier. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore without alteration. Spanish manganiferous ore in demand. Emerystone: Best brands asked for at full figures. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal in fair request, without any alteration in prices. Chrome metal, 5s. 6d. per lb. Chrome ore: Best brands in demand; prices rather stronger. Antimony ore and metal in strong demand at high prices. Asbestos is in strong demand, especially rock, and prices very firm. Potter's lead ore of best and standard brands in request; powdered, £15. 10s.; smalls, £14. to £15.; selected lump, £16. to £17. Calamine: Best qualities are scarce, 60s. to 80s. Strontia steady; sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel steadier. Chrome iron unaltered at last quotations. Ground mica, £50. China clay: In view of the combination, prices are somewhat firmer—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), finest quality, 20s. to 22s.

THE COPPER MARKET.

Messrs. Harrington and Co.'s copper report, dated Liverpool, 19th August, states:—Chili copper charters for first half of August are advised as 1,400 tons fine, price of bars, 24·35 dols. and exchange 23⅞d. The total charters since 1st January have been 15,600 tons, against 14,200 tons same time last year. During the past fortnight, the price of G.M.B. copper was a little irregular, but on the whole advanced about 40s. per ton, and we close to-day at £59. cash and £59. 5s. three months. With the exception of two or three days, there was a fair amount of business done each day. The total visible supply now amounts to 71,094 tons, against 72,533 tons last fortnight, making a decrease of 1,439 tons.

The total decrease for the fortnight in the Liverpool, Swansea, London, and Havre stocks, is 2,189 tons. The present stock of English G.M.B.'s in warehouse, Liverpool and Swansea, is 4,398 tons, against 4,533 tons on 31st ult., showing a decrease of 135 tons. In furnace material, we have the following sales to mention:—50 tons Barancannes ore, at 10s. 6d.; 20 tons Norwegian ore, at 10s., Liverpool; a cargo of Spanish Poderosa mineral to arrive, consisting of 100 tons; precipitate at 11s. 7½d.; 150 tons regulus, 10s. 10½d.; and 5/600 tons ore at 10s. 1½d.; to arrive Swansea, 1,500 tons, Quebrada; regulus at 11s. for 34 per cent.; 200 tons Cape ore at 11s. 3d., and 140 tons Alosno precipitate at 11s. 9d., arrived Liverpool.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Sulphate of Ammonia has strengthened very perceptibly for Scotch shipment, but the stimulant is still the new American demand, exclusively almost, and despatches for Leith loading berths have been very scanty indeed. The Glasgow shipments are chiefly for Montreal discharge, at present the principal seat of the new outlet for this chemical. To-day, for Glasgow f.o.b. shipment, in double bags, as high as £11. 15s. is obtainable; the price at the same time for Leith f.o.b., ordinary sacking, being £11. 8s. 9d. to £11. 10s. Caustic sodas are firmer, and in all but the highest strength have gone up half-a-crown. The alkalies generally are little changed in actual price, but there is an unsettled feeling about them all. Syndicate circulars have been served on manufacturers here, naming bleach prices (very moderately pitched) on to the end of 1891; but there is dubiety as to how much of authority, if any, these bear. Bichromates have eased off further since last reduction, and the inducement to foreign as well as home buyers is now stronger. The output, however, is not yet so large as to give satisfaction to manufacturers here. In the paraffin section the bulk of the activity has gone to burning oil, some makers having about booked full up already over the season, at the half-penny reduction. Lubricating oil is a little easier, but all the other paraffins are strong. Chief prices current are:—Soda crystals, 55s. net Tyne; alum in lump £5. 2s. 6d. net Glasgow; soda ash, 1⅜d. less 5%, Tyne; caustic soda, white, 76°, £12., 70/72°, £10., 60/62°, £9. and cream, 60/62°, £8. 10s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s, and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1⅝d., less 2½% Tyne; saltcake, 30s. to 32s. 6d.; borax, English refined, £29. 10s, and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 5s. to £5. 10s., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 8 and 10% to Scotch and English buyers respectively (export orders, a farthing less, and 5% off); chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 4½d. to 8s. 6d.; sulphate of ammonia £11. 8s. 9d. to £11. 10s. f.o.b. Leith, and £11. 12s. 6d. to £11. 15s. f.o.b., Glasgow, in double bags; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3⅝d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), reduced price, 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less). ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 34,246 bags.

THE LIVERPOOL COLOUR MARKET.

Colours steady. Ochres: Oxfordshire has been quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc, V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

New Companies.

ANGLO-AMERICAN ART COLOUR COMPANY, LIMITED.—This company was registered on the 11th inst., with a capital of £10,000., in £1. shares, to manufacture and sell colours, paints, varnishes, oils, and similar articles. The subscribers are:—

	Shares.
J. D. James, 2 and 4, Stone-street, New York, merchant	1
W. T. Reckwood, 76, The Grove, Ealing, secretary	1
H. R. Shapland, Fonthill-road, Finsbury-park, colour manufacturer	1
W. H. Goodall, 7, Conduit-street, tailor	1
J. T. Crawford, Southend, Essex	1
E. C. Rilsley, 21, College-hill, solicitor	1
R. E. Yates, 43, Digby-road, Finsbury-park	1

FLORIDA PHOSPHATE COMPANY, LIMITED.—This company was registered on the 7th inst., with a capital of £200,000., in £1. shares, to carry on in the United States of America, and elsewhere, the business of miners and prospectors, and to get phosphates, ore, gold, and other mineral substances. An unregistered agreement with Miles Leonard Davies will be adopted. The subscribers are:—

	Shares.
B. Michael, 63, St. Quintin-avenue, W. secretary to a company	1
E. Packard, jun., Bramford, Ipswich, chemical and superphosphate manufacturer	1
H. Merch, Hamburg, superphosphate manufacturer	1
W. G. Couper, 1. Fenchurch-avenue, merchant	1
C. C. H. Millar, 1, Fenchurch-avenue, merchant	1
E. J. Buxton, 23, Thornburn-square, S.E., shorthand writer	1
J. Hodges, 4, Aspley-grove, Wandsworth	1

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Dressing Warps. J. C. Howarth and J. H. Stott. 12,192. August 5.
Recovering Tin from Tinned Waste. W. Beatson. 12 200. August 5.
Electric Meters. H. René. 12,209. August 5.
Economising Fuel. E. Andrews and C. Miller. 12,217. August 5.
Measurement of Electrical Energy.—(Complete Specification.) H. H Lake. 12,221. August 5.
Destroying Noxious Vegetation. E. Rodary. 12,227. August 5.
Rubber Substitute. T. Christy. 12,230. August 5.
Raising or Forcing Water. P. Davies. 12,237. August 5.
Manufacture of Tubes or Pipes. A. J. Boult. 12,238. August 5.
Recording Liquid Measures.—(Complete Specification.) W. M. Fowler. 12,245. August 5.
Non-conducting Covering for Pipes.—(Complete Specification.) H. W. Johns. 12,248. August 5.
Non-conducting Covering for Pipes.—(Complete Specification.) H. W. Johns. 12,249. August 5.
Manufacture of Sulphide of Sodium. M. Netto. 12,251. August 5.
Distillation Apparatus.—(Complete Specification.) A. W. Ellis. 12,260. August 5.
Sulphurous Acid. G. E. Davis and A. R. Davis. 12,273. August 6.
Mono-hydrated Sulphuric Acid. G. E. Davis and A. R. Davis. 12,274. August 6.
Anhydrous Sulphuric Acid. G. E. Davis and A. R Davis. 12,275. August 6.
Bottles for Holding Liquids which Precipitate Sediment. J. B. Bradshaw. 12,280. August 6.
Removing Watery Vapour from Illuminating Gas. B. C. Sykes and G. Blamires. 12,282. August 6.
Treating Refuse. F. Bosshardt. 12,290. August 6.
Fire Bars for Boilers and Furnaces. W. Lord. 12,293. August 6.
Disintegrating Machines.—(Complete Specification.) R. Sauerbrey. 12,311. August 6.
Dessicated Soup. J. G. Lorrain. 12,317. August 6.
A New Alimentary Product. J. G. Lorrain. 12,318. August 6,
Dessicated Extract of Broth. do. 12,319. August 6.
Raising and Forcing Liquids. L. Meglin. 12,322. August 6.
Improved Disinfecting Compound.—(Complete Specification.) H. H. Lake. 12,323. August 6.
Utilization of Compressed or Liquefied Gases. J. M. McMahan. 12,324. August 6.
Pressure and Vacuum Guages.—(Complete Specification) J. Jackson. 12,325. August 6.
Decoctions for Beverages. H. A. Snelling. 12,326. August 6.
Heating Apparatus. J. Garvie, Junr. 12,331. August 7.
Indestructible Electric Filament. C. Herzog. 12,237. August 7.
Obtaining Silver and Other Metals from Ores. J. B. Hannay. 12,342. August 7.
Improvements in Colouring Matters. J. Y. Johnson. 12,356. August 7.
Blue Black and other Azo Colouring Matters. Brooke, Simpson, and Spiller, Ltd., and W. S. Simpson. 12,369. August 7.
Steam Super Heating Apparatus. L. C. Uhler and H. E. A. Depresle. 12,372. August 7.
Manufacture of Saponifiable Fatty Matter from Wool Fat. J. Roos. 12,373. August 7.
A Substitute for Bone or Celluloid.—(Complete Specification.) W. M. Campbell-Callender. 12,375. August 7.
Colouring Matters and Dyestuffs. J. Y. Johnson. 12,386. August 7.
Extraction of Precious Metals by Amalgamation. J. Ketcher. 12,387. August 7.
Steam Traps. J. S. McDougall, J. T. McDougall, and T. Sugden. 12,388. August 7.
Pearl Hardening. J. Beveridge. 12,400. August 8.
Blue Colouring Matters. W. H. Claus. 12,403. August 8.
White Lead. E. V. Gardner. 12,414. August 8.
Treatment of Commercial Xylidine. E. Boernstein and S. Kleeman. 12,415. August 8.
Compressed Gas Cartridges. E. P. Gerrard. 12,417. August 8.
Manufacture of Zinc from Compounds thereof. T. Parker and A. E. Robinson. 12,432. August 8.
Improvements in Pigments or Paints. J. C. Martin. 12,474. August 9.
Connecting Tubes or Pipes. R. W. Lewis, T. S. Lewis, and W. H. Lewis. 12,476. August 9.
Improved Refrigerating Apparatus. J. P. Bayly. 12,496. August 9.
Do. Drying do. S. Seckendorf. 12,505. August 9.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

A. E. F. PILLING and J. J. HARGREAVES, Manchester, brewers.

Adjudications.

GEORGE CORMACK, Durham and Newcastle-on-Tyne, chemist.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Aug. 9th.

Acetic Acid—
Holland, 69 pks. A. & M. Zimmermann
Belgium, 1 pkg. Leach & Co.
Holland, 50 Beresford & Co.
" 70 pks. A. & M. Zimmermann
" 50 Beresford & Co.

Antimony Ore—
Spain, 30 t. H. Emanuel
" 8 Pillow, Jones, & Co.
N. Zealand, 8 Major & Field
Italy, 1 A. Polimeni
Portugal, 18 H. Emanuel
Japan, 6 G. N. Souratty & Co.
France, 21 Pillow, Jones, & Co.
Spain, 8 "

Alum—
Holland, £25. Magee, Taylor, & Co.
" 263 Ohlenschlager Bros.

Barium Chloride—
Germany, £60. Petri Bros.

Borax—
Germany, £25. F. Stahlschmidt & Co.
" 120 A. & M. Zimmermann
" 28 F. Stahlschmidt & Co.

Bones—
Trinidad, 4 t. Culverwell, Brooks, & Co.

Boracic Acid—
France, 20 pks. Gellatly, Hankey, & Co.
Italy, 20 pkgs. J. Puddy & Co.

Barytes—
Belgium, 32 cks. T. & W. Farmiloe
Holland, 22 Phillipps & Graves
" 22 "
" 20 Newcomb & Son
" 22 Harrison & Co.
" 42 Magee, Taylor, & Co.
Germany, 14 H. Lambert
Holland, 20 Newcomb & Son
Germany, 20 G. Steinhoff
Belgium, 19 W. Harrison & Co.
Holland, 22 O'Hara & Hoar

Caustic Potash—
France, 11 pkgs. J. A. Reid

Copper Ore—
U. S., 25 t. R. M. S. P. Co.
Sydney, 36 W. Balchin
" 36 "
Adelaide, 58 Harrold Bros.
Italy, 2 E. Teteur

Caoutchouc—
Chiloane, 12 c. Elkan & Co.
Greytown, 32 Prop. Bull Wf.
Spain, 44 M. Goyenecheoleo
E. Indies, 162 L. & I. D. Jt. Co
Singapore, 57 R. & J. Henderson
S. Africa, 15 J. Owen
Quilimane, 22 Elkan & Co.
Mozambique, 180 c. Cundall & Co.
Madagascar, 112 Prop. Bull Wf.
E. Indies, 25 Hale & Son
Singapore, 16 L. & I. D. Jt. Co.
Algoa Bay, 20 Hammond & Co.
Chiloame, 12 Elkan & Co.
Singapore, 184 Kleinwart, Sons, & Co.
Savanilla, 3 Prop. Bull Wf.
Inhambane, 18 W. M. Smith & Sons

Cream of Tartar—
France, 5 pks. J. Puddy & Co.
Spain, 10 W. C. Bacon & Co.
Holland, 4 Middleton & Co.
France, 2 Bryant & Aitkers

Carbolic Acid—
Holland, 40 pks. Typke & King

Copper Sulphate—
Germany, £110. Charles & Fox

Chemicals *(otherwise undescribed)*
Holland, £16. Barr, Moering, & Co.
Germany, 79 T. H. Lee
" 40 Craven & Co.
" 75 A. & M. Zimmermann
Germany, 7 Phillipps & Graves
Holland, 12 W. Bauer & Co.
Germany, 35 Craven & Co.
" 480 A. & M. Zimmermann
" 40 Phillipps & Graves
" 35 H. Lorenz
Holland, 12 pks. Phillipps & Graves
France, 10 Carey & Sons

Chemicals—*continued.*
Germany, £170. A. & M. Zimmermann
" 138 T. H. Lee
Holland, 10 Domeier & Co.
" 14 A. & M. Zimmermann

Dyestuffs—
Tanners' Bark
France, 5 t. W. A. Bowditch
Holland, 24 S. Barrow & Bros.
Melbourne, 93 N. Z. L. & M. A. Co., Limited
Sydney, 26 Hicks, Nash, & Co.
Holland, 50 J. Greaves
Adelaide, 14 Aevitt & Hett
U. S. 11 A. J. Humphrey
Melbourne, 115 Baxter & Hoare
Sydney, 18 Flack, Chandler, & Co.
Anthracene
Holland 17 pks. Bent, Boulton, & Co.
Myrabolams
Germany, 348 pks. Hoare, Wilson, & Co.
Fustic
Colon, 36 t. Marshall & French
Turmeric
Cochin, 299 pkgs. Anderson, Weber, & Smith
Extracts
France, 57 pkgs. G. S. N. Co.
Holland, 30 T. H. Lee
U. S., 150 Skilbeck Bros.
France, 195 pks. L. J. Levinstein & Sons
" 25 T. H. Lee
U. S., 50 Skilbeck Bros.
Argols
France, 46 pks. N. S. S. Co., Ld.
Almeria, 3 pkgs. Cundall & Co.
Italy, 1,050 B. Jacob & Sons
France, 17 Knowles & Foster
Italy, 87 pks. Thames S. Tug Co.
Cochineal
Canaries, 15 pkgs. Swanston & Co.
" 9 A. Levy & Co'
Gambier
Singapore, 423 pkgs. W. H. Cole & Co.
" 580 Beresford & Co.
" 431 Cox, Patterson, & Co.
" 435 W. H. Cole & Co.
" 86 pks. H. Lambert
" 210 Ashmore & Son
" 282 Elkan & Co.
Sumac
Austria, 200 pkgs. M. D. Co.
Italy, 350 J. Kitchen, Ld.
" 200 J. Knill & Co.
Cyprus, 68 Knowles & Foster
Cutch
Rangoon, 175 pkgs. Anderson, Weber, & Smith
Denmark, 49 "
E. Indies, 340 Wrightson & Son
Indigo
E. Indies, 6 chts. L. & I. D. Jt. Co.
Valonia
Smyrna, 100 t. F. Huth & Co.
Alizarine
E. Indies, 10 pks. P. & O. Co.

Glycerine—
Germany, £100. Beresford & Co.
Holland, 500 Spies, Bros., & Co.
Austria, 650 Bailey & Leetham
Germany, 92 Beresford & Co.
" 45 "
" 70 H. Lambert

Gutta Percha—
Singapore, 196 c. Soundy & Son
" 300 Hoare, Wilson & Co.
Germany, 2 L & I. D. Jt. Co.

Glucose—
Germany, 25 pkgs. 225 c. J. Knill & Co.
U. S., 65 325 T. M. Duche
" 500 500 Union Lighterage Co., Ltd.
Germany, 10 89 H. J. Perlbach & Co.
U. S. 75 446 Soundy & Son
92 506 Botolphl & Nich's Wvs. Co. Ltd.
" 20 110 Page, Son & East
" 100 300 L. & I. D. Jt. Co.

Glucose—*continued.*
" 55 275 T. M. Duche & Sons
" 50 250 Pillow, Jones & Co.
" 50 280 Horne & Co.
Germany 10 93 J. Knill & Co.
France, 100 100 J. Barber & Co.
U. S. 100 600 Propr's. Scott's Wf.
" 400 400 Barrett Tagant & Co.
Germany, 200 200 " "
" 800 800 J. Barber & Co.
" 25 245 Propr's. Chmbln's Wf.
" 50 255 Baxter & Hoare
100 116 H. A. Litchfield & Co.
" 50 420 J. H. Epstein

Iron Bromide—
Germany, £260 A. & M. Zimmermann

Isinglass—
Singapore, 5 pks. L. & I. D. Jt. Co.
" 20 pkgs. H. Gluck & Co.
N. Russia, 1 J. Vickers
Penang, 15 E. Bonstead & Co.

Manure—
France, 100 t. T. Farmer & Co.
Holland, 206 Anglo Cntntl. Guano Works
Phosphate Rock
Montreal, 100 t. A. Hunter & Co.

Naphtha—
Holland, 25 drs. Stein Bros.
" 55 Burt Boulton & Co.

Nitre—
Germany, 17 cks. Craven & Co.

Paraffin Wax—
U. S. 100 brls. J. Lucey & Sons
" 500 J. H. Usmar & Co.

Potassium Muriate—
France, 21 pkgs. Carey & Sons
Holland, 4 pks. Spies, Bros. & Co.

Potassium Carbonate—
France, 7 pkgs. J. A. Reid
" 9 pks. Beresford & Co.

Pearl Ashes—
France, 95 c. Petri Bros.

Pitch—
Germany, 25 brls. C. B. Leighton
France, 95 " "

Plumbago—
E. Indies, 80 brls. L. & I. D. Jt. Co.
Holland, 50 cks. Brown & Elmslie
Germany, 38 Le Sueur & Co.
E. Indies, 1,317 H. H. Medcalf
Germany, 119 pks. Prop. Scott's Wf.
" 34 cks. " "

Saltpetre—
Germany, 35 cks. P. Hecker & Co.
" 100 T. Merry & Son
Holland, 47 J. Hall & Son
E. Indies, 1,521 bgs. C. Wimbler & Co.
Germany, 17 cks. Craven & Co.
" 50 kgs. P. Hecker & Co'

Stearine—
Belgium, 25 bgs. H. Hill & Sons
France, 120 "
U. S. 40 cks. J. Goddard & Co.

Sodium Nitrate—
Germany, £29 H. Lambert

Salicylic Acid—
Holland, 12 pks. Fuerst Bros.
" £25 R. Morrison & Co.

Sodium Sulphate—
Holland, £50 Prop. Dowgate Dk.

Sodium Hyposulphite—
Holland, £50 Prop. Dowgate Dk.

Sodium Prussiate—
Germany, £96 Spies Bros. & Co.

Sugar of Lead—
Germany, 10 pks. Petri Bros.

Tartaric Acid—
Holland, 12 pks. Middleton & Co.
" 4 F. W. Heilgers & Co.
" 4 " "

Tartaric Acid—*continued.*
" 44 pkgs. B. & F. Wf. Co. Ltd.
Germany, 20 O Andrae & Co.

Tartars—
Italy, £420 B. Jacob & Sons

Ultramarine—
Holland, 10 pks. Seaward Bros.
" 9 Haeffner Hilpert & Co.
" 7 cs. Glaeser & Volger
" 4 cks. Spies, Bros. & Co
" 6 pks. Ohlenschlager Bros.

Verdigris—
France, £30 C. Brumlen

Zinc Oxide—
Germany, 50 brls. M. Ashbey, Ltd.
Holland, 50 " "

LIVERPOOL.

Week ending August 12nd.

Antimony Ore—
Smyrna, 3,040 bgs.

Acetate of Lime—
New York, 1,217 bgs.
" 868 bgs.

Albumen—
Marseilles, 5 brls.

Bones—
Alexandria, 937 bgs.
Valparaiso, 102 sks.
Campana, 84 bgs.
Smyrna, 80 t.

Borax—
Leghorn, 30 cks.
Rouen, 4 cks. Co-operative W'sale Society Ltd.

Boracic Acid—
Leghorn, 30 cks.

Barytes—
Hamburg, 24 cks.
Ghent, 100 bgs.
" 97 Goodlass, Wall & Co.
" 29 Heywood, Clarke & Co.

Charcoal—
Rouen, 120 bgs. Co-op. W'sale Society, Ld.

Cobalt Ore—
Havre, 5 cks. Cunard S.S. Co., Ld.

Carbon—
Philadelphia, 560 bgs. Morris, Ashley & Co.

Cream of Tartar—
Genoa, 5 cks.
Bordeaux, 8 cks.

Caoutchouc—
Carthagena, 39 brls. M. Goyenechi & Co.
" 15 Rosing Bros.
Colon, 6 D. Midgley & Son
Akassa, 35 bgs. Royal Niger Co.
Quitta, 1 8 cs. J.H.Rayner & Co.
" 11 F. & A. Swanzy
Accra, 2 cks. Edwards Bros.
" 5 Pickering & Berthoud
" 1 A. Brown & Son
" 12 Hutton & Co.
" 6 J. J. Fisher & Co.
" 23 J. P. Werner
" 1 cs. 3 F. & A. Swanzy
Cape Coast, 20
" 5 Taylor, Laughland & Co.
" 4 Mordaunt Bros.
" 5 Fletcher & Fraser
" 3 H. B. W. Russell
" 1 cs. 4 Edwards Bros.
" 1 L. Hart & Co.
" 2 E. Wayland
" 3 C. L. Clare & Co.

Caoutchouc—*continued.*
Cape Coast, 2 cks. Whaite & Co.
" 2 Davies, Robbins & Co.
" 3 W. Duff & Co.
" 2 Ellis & Co.
" 1 Milward, Bradbury & Co.
" 1 F. & A. Swanzy
" 1 cs. Edwards Bros.
" 1 A. Millerson & Co.
" 4 Pickering & Berthoud
" 1 F. J. Eaton & Son
" 2
Assinee, 1 F. J. Eaton & Son
" 4 Radcliffe & Durant
Gr. Bassam, 10 Milward, Bradbury & Co.
" 1 Radcliffe & Durant
" 2 2 Edwards Bros.
" 4 W. D. Woodin
" 3 Pitt Bros. & Co.
" 1 T. E. Tomlinson & Co.
" 1 3 Oppenheimer Bros. & Co.
" 5 F. & A. Swanzy
Sierra Leone, 5 brls. 31 pns. Cié Francaise
" 2 F. Millington & Co.
" 29 5

Dyestuffs—
Yellow Berries
Smyrna, 20 bgs.
Extracts
Trieste, 2 brls.
New York, 15
Fustic
Carthagena, 1,191 ps. Rosing Bros.
Havre, 417 Cunard S. S. Co. Ltd.
Annatto
Bordeaux, 5 cks.
Sumac
Palermo, 250 brls. 300 bgs.
Bordeaux, 25 bls.
Myrabolams
Calcutta, 1,000 bgs. 800 pkts.
Bombay, 585
" 1,000 D. Sassoon & Co.
Argols
Oporto, 23 cks. Cotsworth, Lyne & Co.

Glucose—
Hamburg, 74 cks.
Rouen, 5
New York, 250 brls.
Stettin, 35
Hamburg, 75

Glycerine—
Rotterdam, 5 dms.
Hamburg, 5 cs.
Bordeaux, 100 cks.
Marseilles, 2 dms. H. Appleby

Horn Piths—
B. Ayres, 39 t. Williamson, Milligan & Co.
Valparaiso, 647 sks.
B. Ayres, 9,500
Paysandu, 7,120 J. Gordon & Co.

Manganese Ore—
Gothenburg, 100 t. Macqueen Bros.

Pitch—
Rotterdam, 46 cks.
Rouen, 24 Co-op. Wholesale Society, Ltd.
Bordeaux, 23

Potash—
Rouen, 77 cks. Co-op. Society, Wholesale Ltd.

Pyrites—
Huelva, 1,522 t. Tennants & Co.
" 2,171 "
" 1,150 Matheson & Co.

Phosphates—
Ghent, 1,093 bgs.
" 500 t.

Plumbago—
Genoa, 11 cks. E. G. Hitch
" 80 bgs.

Sulphur—
Catania, 700 bgs. 2 brls.
Palermo, 100

Sulphur Ore—
Huelva, 1,452 t. Matheson & Co.

Saltpetre—
Hamburg, 54 cks.

Tartar—
Bari, 2 cks.

Tartaric Acid—
Trieste, 28 cks.

Ultramarine—
Hamburg, 12 cs.

Verdigris—
Marseilles, 10 brls. J. A. & W. Bird & Co.

Waste Salt—
Hamburg, 120 t. 1,499 bgs.

Zinc Ashes—
Boston, 9 brls.

Zinc Oxide—
Terneuzen, 120 cks.
New York, 50 brls.

GOOLE.

Week ending August 6th.

Alum—
Rotterdam, 16 brls.

Dyestuffs—
Alizarine
Rotterdam, 42 cks.
Extracts
Rotterdam, 2 brls.
Logwood
Jamaica, 1,115 t.
Dyestuffs (*otherwise undescribed*)
Boulogne, 19 cs. 49 cks.

Glucose—
Calais, 200 bgs.
Hamburg, 100 34 cks.
Dunkirk, 120
Hamburg, 140

Potash—
Calais, 9 drums.
Rotterdam, 53 pks.
Dunkirk, 19 cks.
Antwerp, 21 drums.
Calais, 20

Phosphate—
Ghent, 800 bgs.

Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 20 cks.

Sodium Nitrate—
Rotterdam, 10 brls.

Waste Salt—
Hamburg, 1,016 bgs. 300 t. 392 cks.

HULL.

Week ending August 14th.

Ammonium Sulphate—
Hamburg, 15 brls. Wilson, Sons & Co.

Albumen—
St. Petersburg, 40 cs.
Riga, 1

Alumina—
Rotterdam, 4 cks. W. & C. L. Ringrose

Barytes—
Hamburg, 36 cks. Wilson Sons & Co.
Antwerp, 54 Bailey & Leetham
Bremen, 115 Veltmann & Co.
" 19 Blundell, Spence, & Co.
" 19

Chemicals (*otherwise undescribed*)
Dunkirk, 3 cs. 59 pks. Wilson, Sons, & Co.
Antwerp, 39 "
Christiansand, 10 "
Bari, 11 cks. "
Rotterdam, 2 W. & C. L. Ringrose

Dyestuffs—
Rennet
Rotterdam, 2 bkts. "
Copenhagen, 1 ck. Wilson, Sons & Co.
Argols
Bordeaux, 70 bgs. Rawson & Robinson
Sumac
Palermo, 500 bgs. Wilson, Sons & Co.
" 200
Alizarine
Rotterdam, 24 pks. W. & C. L. Ringrose
" 23 cks. "
" 36 pks. "

Glucose—
Hamburg, 100 bgs.
Stettin, 13 cks. 250 bgs. Wilson, Sons & Co.
" 600 "

Phosphate—
Ghent, 160 t. Wilson, Sons & Co.

Pyrites—
Huelva, 1,010 t.

Phosphorus—
Rouen, 100 cs. Wilson, Sons & Co.

Pitch—
Rotterdam, 44 cks. W. & C. L. Ringrose

Potash—
Rotterdam, 44 G. Lawson & Sons

Sulphate—
Antwerp, 20 cks. Johnson Bros.

Sulphur—
Catania, 2,082 pks. Wilson, Sons, & Co.

Stearine—
Rotterdam, 30 bgs. Wilson, Sons, & Co.
" 54 brls. W. & C. L. Ringrose

Tartar—
Bordeaux, 2 cks. Rawson & Robinson

Turpentine—
Bordeaux, 20 brls.
Trieste, 2 J. Good & Sons

Ultramarine—
Rotterdam, 12 cks. Sissons, Bros., & Co.

Zinc Oxide—
Rotterdam, 25 cks.

GLASGOW.

Week ending August 14th.

Barytes—
Antwerp, 21 cks.
Rotterdam, 135

Dyestuffs—
Fustic
Jamaica, 53 t. 5 c.
Extracts
Rotterdam, 2 cks.
Antwerp, 1 ck. 1 cs.
Alizarine
Rotterdam, 59 cks.
" 51

Glucose—
New York, 50 brls.
" 250
" 114

Paraffin Wax—
Philadelphia, 850 brls.

Salt—
Nantes, 1 bg.

Sulphur Ore—
Drontheim, 250 t.

Tar—
Archangel, 1,380 brls. Young, Falconer & Co.

Tartaric Acid—
Rotterdam, 7 cks.

Tartar—
Bordeaux, 1 ck.

Ultramarine—
Rotterdam, 2 cks. J. Rankine & Son
Antwerp, 10 cs.

Waste Salt—
Hamburg, 508 bgs.

Zinc Oxide—
Rotterdam, 50 cks.
Antwerp, 50
" 45 brls.

Zinc Ashes—
Bordeaux, 26 cs.

TYNE.

Week ending August 13th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.

Copper Precipitate—
Huelva, 10,381 bgs. Scott Bros.

Glycerine—
Hamburg, 1 cs. Tyne S. S. Co.

Pitch—
Antwerp, 25 brls. Tyne S. S. Co.

Pyrites—
Huelva, 1,651 t. Scott Bros.

Salt—
Hamburg, 700 t. Clephams & Wiencke

GRIMSBY.

Week ending August 9th.

Albumen—
Hamburg, 7 cks.

Chemicals (*otherwise undescribed*)
Hamburg, 3 pks.

Pitch—
Dieppe, 5 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Aug. 6th.

Acetic Acid—
Canterbury, 10 cs. £24

Ammonia—
Santos, 1 t. 4 c. £41

Ammonium Muriate—
Sydney, 3 t. 9 c. £90

Acids (*otherwise undescribed*)
Cologne, 270 btls. £430

Ammonium Sulphate—
Cologne, 37 t. £416

Ammonium Sulphate—*continued.*
Rotterdam, 15 180

Ammonium Carbonate—
M. Video, 9 c. £18
B. Ayres, 10 cs. 35

Bisulphide of Carbon—
Rotterdam, 4 t. £50

Bisulphate of Lime—
Calcutta, 1 t. 14 c. £34

Brimstone—
Calcutta, 10 t. 1 c. £51

Coal Products—
Carbolic Acid
Rotterdam, 40 cks. £516

Naphtha
Sydney, 45 drs. £37

Naphthaline
Libau, 3 cks. £18
Hamburg, 40 74
" 100 bgs. 67
Rotterdam, 685 29 cks. 165

Benzole
Calais, 44 cks. 576
Terneuzen, 16 36

Tar
Gothenburg, 25 cks. £38
" 525 500
Danzig, 500 bls. 200

Tar—*continued.*
Mauritius, 25 rlts. 15
Adelaide, 63 drs. 21
Melbourne, 70 35

Pitch
Gothenburg, 50 bls. 38
Constantinople, 200 80
Odessa, 450 162
Boston, 1,000 392
Antwerp, 445 675

Citric Acid—
Barcelona, 14 cks. £459
St. Petersburg 20 677
Rotterdam, 2 c. 15

Citric Acid—*continued.*

Hamburg,	2 c.		14
,,	6		47
Calcutta,	3		25
Barcelona,	1 t.		160
Riga,	½ kgs.		14
St. Petersburg,	1 t.	10 c.	240
Dunedin,	1 kg.		10

Carbolic Solid—

Yokohama,	4,000 lbs.	£199
Barcelona,	4,000	300
,,	6 t. 19 c.	415
Toronto,	1,075 lbs.	75
Antwerp,	48 drs.	798

Carbolic Acid—

Calcutta,	20 drs.	£17
Yokohama,	2 t. 8 c.	100
Auckland,	26 pks.	29
Hamburg,	5 t. 12	101
Antwerp,	5	550
Genoa,	1	120

Caustic Soda—

Odessa,	50 t. 1 c.	£460
Melbourne,	1 6	29
Madrid,	10 3	140

Copper Sulphate—

Salonica,	2 t. 3 c.	£44
M. Video,	10	14
,,	1	63
Calcutta,	5	114
Salonica,	1 10	33
Antwerp,	7 15	160
Oporto,	1 4	20

Cream of Tartar—

Sydney,	10 c.	£57
Melbourne,	20 pks.	100
Sydney,	10	51
Auckland,	5	28
Calcutta,	3	16
Melbourne,	2 t.	202
Sydney,	2	230
Launceston,	5	26
Melbourne,	1	110

Disinfectants—

Rio Janeiro,	1 t. 9 c.	£30
B. Ayres,	1 17	46
Melbourne,	14 cs.	44

Ehrannite—

Mauritius,	4 t. 9 c.	£120

Guano—

Melbourne,	50 t.	£500
Adelaide,	25	250

Hypophosphite of Lime—

Rotterdam,	9 c.	£108

Hydro-Carbon—

Brussels,	1 t. 10 c.	£26

Insect Powder—

E. London,	1 cs.	£25

Muriatic Acid—

M. Video,	15 c.	£19

Manure—

Demerara,	30 t.	£307
Stettin,	200	950
Libau,	500 1 c.	1,540
Riga,	220	687
Gothenburg,	546 4	2,065
Griefswald,	100	500
Mauritius,	83	1,000
Demerara,	50	500
Canterbury,	100	462
Danzig,	69	320
Riga,	1,700 bgs.	519
Bordeaux,	15 t.	90
St. Nazaire,	469	2,355
Berbice,	5 1 c.	88
Stettin,	219 13	770

Nitric Acid—

M. Video,	10 c.	£29
Rio Janeiro	20 cs.	56

Oxalic Acid—

Melbourne,	5 cks.	£18
,,	15 c.	28
,,	5 cks.	18

Phosphate—

Barbadoes,	9 t. 19 c.	£75

Phosphorus—

Barcelona,	9 c.	£120
Yokohama,	20 cs.	215

Potassium Chlorate—

Lisbon,	2 t. 11 c.	£110
,,	6 brls.	14
Barcelona,	4 t.	177

Potassium Sulphate—

Barbadoes,	10 t.	£105

Phosphoric Acid—

Demerara,	3 t.	£49

Potash—

Melbourne,	20 cks.	£43

Salammoniac—

Salonica,	2 t. 4 c.	£22
Galatz,	12	20

Soda Ash—

Colombo,	17 t.	£115

Sulphur Flowers—

Algoa Bay,	6 t. 14 c.	£81

Sulphur—

Cape Town,	50 cks.	£46
Sydney,	5 t.	75
Lisbon,	8 brls.	6
Terceira,	5	3

Sulphuric Acid—

Calcutta,	10 cs.	£12
M. Video,	1 t. 17 c.	30
Singapore,	2 3	15
Natal,	1 10	15

Soda Crystals—

Canterbury,	4 t. 18 c.	£16

Sheep Dip—

Wellington,	1 t.	£40
Natal,	400 drs.	64
E. London,	50 gls.	5
Algoa Bay,	500 drs.	112

Saltpetre—

M. Video,	10 c.	£11
Melbourne,	2 t.	45
Rio de Janeiro,	2 5	50
Piræus,	1 7	38
Melbourne,	1	22
Vigo,	3 15	80
Rio de Janeiro,	3 8	77
Odessa,	3 8	70
Santos,	9 16	220
Rio de Janeiro,	2 9	55
P. Allegre	16	17
Terceira,	7	9
Lisbon,	14 14	302
Cadiz,	2 10	54

Sodium Acetate—

New York,	46 pks.	£165

Superphoshate—

Riga,	594 t. 3 c.	£1,782

Sodium Bicarbonate—

Auckland,	4 t. 6 c.	£23

Sodium Sulphate—

Ghent,	50 t.	£50

Solvent Naptha—

Treport,	4 t. 12 c.	£99

Soda Crystals—

Sydney,	26 t.	£87

Tartaric Acid—

Hong Kong,	3 c.	£23
Sydney,	1 t.	139
Calcutta,	1	8
Launceston,	3	22

LIVERPOOL.

Week ending August 9th.

Ammonium Sulphate—

Malaga,	50 t.			£600
Philadelphia,	2	2 c.		504
Saurahaya,	101	14	3 q.	1,205
Gr. Canary,	1		1	12
Malaga,	49	6	3	570
Naples,	2	2	3	26
Gr. Canary,	10	2	2	115
New York,	50	13	1	586

Arsenic Acid—

New York,	14 t	8 c.	1 q.	£216

Alum Cake—

Bombay,	6 t.	4 c.	3 q.	£30
Boston,	10	3		44
Bombay,	3	9	3	11
Calcutta,	15	14	1	£50

Ammonium Carbonate—

Rotterdam,		5 c.		£8
Boston,		11	1 q.	16
Venice,		10	2	17
Genoa,	1 t.			42
,,		6		10
Havre,	3	4	2	84
Naples,	1	10	2	50
Gothenburg,		6	2	11

Alum—

Constantinople,	1 t.	14 c.	1 q.	£8
Perotas,		3	2	5
Samsoun,	3	12		19
Seville,	2			10
Sydney,		10		5
Calcutta,	75			375
Havana,	5	19		50
Malaga,	1			5
Melbourne,	3	1		16
Bari,	2	1		10
Rio de Janeiro,	1	2		6
New York,		11		6

Acetic Acid—

Porto Alegre,		3 c.	2 q.	£10

Ammonia—

New York,	1 t.	15 c.		£100

Ammonium Muriate—

St. Johns N.B.		11 c.		£14

Borax—

Venice,		5 c.	1 q.	£8
Dunedin,		6	1	9
Taltal,		4		8
Halifax,	1	1		29
Antwerp,	2		3	55
Antofagasta,		3	2	26
Rotterdam,	1		3	28

Boracic Acid—

Antwerp,	2 t.	1 c.	1 q.	£77
Rotterdam,	1	10		36

Brimstone—

Gothenburg,	25 t.	£113
Nantes,	10	50

Borate of Lime—

Rotterdam,	15 t.	9 c.	3 q.	£200

Bleaching Powder—

Amsterdam,	27 cks.	
Baltimore,	55	
Boston,	157	
Ghent,	138	
Havana,	50 cs.	
Malaga,	8	
New York,	5 brls.	
Terneuzen,	25	
Amsterdam,	6	
Antwerp,	33	
Boston,	167 tcs. 638	
B. Ayres,	2 cs.	
Genoa,	28	
Ghent,	129	
Hamburg,	28	
Malaga,	4 brls.	
Nantes,	12	
New York,	364 298 pks.	
Rio de Janeiro,	10 cs.	
Rotterdam,	40	
Rouen,	103	

Caustic Soda—

Savanilla,	20 dms.	
Stettin,	15	
Sydney,	20	
Trieste,	10	
Vera Cruz,	300	
Alexandria,	36	
Amsterdam.	50	
Ancona,	20	
Antwerp,	20	
Bahia,	5	
Bari,	107	
Carlshrona,	20	
Carthagena,	1 cs.	
E. London,	5	
Fiume,	50	
Genoa,	80	
Hamburg,	5	
Havana,	20	
La Guayra,	8	
Leghorn,	50	
Malaga,	15	
Montreal,	100	
Naples,	4	
Newfairwater,	30	
New Orleans,	150	
New York,	200	
Odessa,	700	
Puerto Cabello,	11	
Riga,	90	
Rio Grande do Sol,	100	
Rotterdam,	15	
New York,	100 brls. 1,697	
Nuevitas,	21	
Odessa,	25	
Oporto,	135	
Philadelphia,	50	
Puerto Cabello,	10	
Riga,	400	
Rio de Janeiro,	15	
Rouen,	25	
Seville,	40 cks. 200	
Tarragona,	80	
Valencia,	66	
Valparaiso,	75	
Venice,	107	
Alexandria.	20	
Alicante,	65	
Amsterdam,	344	
Antwerp,	26 brls. 48	
Barcelona,	68	
Boston,	450	
Brisbane,	50	
Cape Town,	2 12	
Carril,	16	
Cienfuegos,	25	
E. London,	6 bxs.	
Galatz,	60	
Galveston,	35	
Genoa,	155	
Ibrail,	23	
La Guayra,	15	
Leghorn,	20	
Maceio,	60	
Malaga,	12 brls 68	
Melbourne,	74	
Mount Video,	150	

Caustic Soda—*continued.*

Montreal,	200	
Nantes,	138	
Naples,	40	

Copper Sulphate—

St Johns, Nf.	4 t.	1 c.	3 q.	£96
Montreal,	9	15		199
Ancona,	2	7	3	42
Bari,	23	4	1	423
Genoa,	5	14		119
Galatz,	3			62
Hamburg,	10		1	180
Salonica,	1	3	2	20
Ancona,	1	5		25
Antwerp,	5	2		100
Odessa,	38	3	3	740
Salonica,	2	3	2	38
Leghorn,	5	2	3	103
Marseilles,	1	17		37
Melbourne,	11			199
Montreal,	2	7		44
Rotterdam,	10	7	3	212
Santander,	10	2	1	176
Suakim,		5		8
Alexandria,	2	1		41
Ancona,	1	15		30
Catania,	19	3		412
Genoa,	6	8		113
,,	3	10		75
La Union,	2			42
Bari,	6	7	1	114
Melbourne,	25			522
Nantes,	23	13		553
Naples,	1	13	2	30
Norkoping,	2	2	3	38
Sydney,	6			113
Hamburg,	3	15		65
Odessa,	3	2		53
Ghent,	1	1	2	18

Copperas—

Syra,	5 t.	14 c.	3 q.	£11
Constantinople,	7	3		13
Saurahaya,	5	7		17
Smyrna,	2	9	2	5
Montreal,	7	9		14

Carbolic Acid—

Montreal,	4 cks.			£37
Yokohama,	4 t.	10 c.		312
Hamburg,	2	5	2 q.	148
Montreal,		11	2	25
Panama,		3		5

Calcium Chloride—

New York,	12 t.	10 c.		£26

Caustic Potash—

Havre,	2 t.	1 c.		£41

Disinfectants—

B. Ayres,	7 c.	3 q.		£9
Bombay,	16			25

Epsom Salts—

Rio Janeiro,	50 kgs.			
Bombay,	100			
Maceio,	1			

Glycerine—

Montreal,	1 t.			£45
Vera Cruz,	2	10 c.		105
Rotterdam,	18	15		360
Hamburg,	8			193
Montreal,	2			90

Gypsum—

New York,	10 t.	2 c.	1 q.	£30

Lead Chromate—

New York,	8 c.	1 q.		£9

Magnesia—

Porto Alegre,	11 cs.			
,,	3			

Manure—

Philadelphia,	50 t.			£575
St. Nazaire,	200	5 c.		1,058
Bordeaux,	32	10	3 q.	282

Potash—

Havana,	5 c.	1 q.		£11
M. Video,	1 t. 18	3		52

Potassium Carbonate—

Boston,	8 t.	17 c.		£131

Phosphorus—

B. Ayres,	1 t.	12 c.		£165
Havana,		1		8

Potassium Chlorate—

B. Ayres,	8 c.			£20
Hiogo,	1 t.	2		61
Shanghai,	2	10		106
Copenhagen,	1			42
Gothenburg,	19	10		857
Hiogo,	3	18		180
Kobe,	5			230
New Orleans,	2	10		105
B. Ayres,		10		23
New York,	2	10		75
Boston,	2	10		75
Hiogo,	16	1		678
Hong Kong,	2	15		130
B. Ayres,	1	6	1 q.	39
Rosario,	6 cks.			12
M. Video,	9			23

Potassium Bichromate—
Piræus, 7 c. £15
Salonica, 1 t. 12 52
Pitch—
Cadiz, 220½ t.
Montreal, 200 brls.
New York, 100
Saltpetre—
Gr. Canary, 6 c. £7
Piræus, 7 t. 10 162
Larnaca, 3 15 83
B. Ayres, 2 45
Superphosphate—
Lubeck, 260 t. £780
Salammoniac—
Trieste, 1 t. £35
Galatz, 10 c. 18
Genoa, 1 13 3 q. 59
Meralyne, 4 7
Beyrout, 2 9 87
Montreal, 7 3 12
B. Ayres, 5 2 10
Trieste, 1 3 36
Sulphur—
Boston, 25 t. 1 c. £106
" 50 2 220
" 25 1 120
Calcutta, 15 90
Montreal, 50 2 225
Soda Crystals—
Toronto, 50 kgs.
Boston, 2,260 brls.
B. Ayres, 27
Calcutta, 14
New York, 280 cks.
Philadelphia, 374 170
Soda Ash—
Baltimore, 149 cks.
Boston, 181
Monte Video, 150 brls.
New York, 130 tcs. 40
Philadelphia, 670
Rio de Janeiro, 50
Baltimore, 136
Batoum, 35
Boston, 346 tcs. 500 bgs. 109 pks.
B. Ayres, 8 cks.
Cape Town, 2
Corfu, 50 brls.
Ghent, 38
Kingston, 13
Leghorn, 42
New York, 968 147
Oporto, 10
Philadelphia, 29
Puerto Cabello, 20
Rio de Janeiro, 25
Seville, 50
Smyrna, 50
Waterloo, 5 tcs.
Zante, 10
Sodium Bicarbonate—
Amsterdam, 30 kgs.
Antwerp, 100
Barcelona, 66
B. Ayres, 15 cks.
Copenhagen, 8 187
Hamburg, 22 35
Ibrail, 4
Montreal, 400
Nantes, 7
New York, 10
Toronto, 30 25
Sodium Arsenite—
New York, 8 c. 2 q. £6
Sodium Silicate—
Cape Town, 6 brls.
Santander, 64 cks.
Seville, 47
Salt Cake—
Baltimore, 131 t. 1 c. £317
New York, 25 2 63
Sheep Dip—
Algoa Bay, 3 t. £131
Salt—
Addah, 2½ t.
Boston, 65
Bremerhaven, 264
B. Ayres, 23
Laurvig, 300
Malmo, 225
Para, 71 8 c.
Wilmington, 391
New York, 65
Akassa, 182
Bonny, 50
Boston, 200
Calcutta, 2,490
Cape Town, 100
Charlestown, 515
Chicago, 300
East London, 28 10
Gothenburg, 40

Salt—*continued.*
Manaos, 19 t. 10 c.
Melbourne, 150
Montreal, 250
New Orleans, 250
New York, 80
Old Calabar, 60
Para, 339 17
Rotterdam, 296
Sierra Leone, 45
Zinc Chloride—
Bombay, 2 t. 2 c. 2 q. £51
Rotterdam, 5 8 36

TYNE.

Week ending August 13th.

Arsenic—
Barcelona, 19 c.
Ammonium Sulphate—
Rotterdam, 37 t.
Ammonium Carbonate—
Copenhagen, 6 c.
Alum—
Rotterdam, 10 t.
Aluminium—
Constantinople, 1 cs.
Alkali—
Amsterdam, 15 t. 11 c.
Copenhagen, 23 7
St. Petersburg, 52 9
Horsens, 2 10
Antwerp, 5 7
Hamburg, 4 16
Rotterdam, 3 7
Antimony—
Ergastiria, 1 c.
Rotterdam, 2 t. 10
Bleaching Powder—
Amsterdam, 2 t. 12 c.
Aarhuus, 13 12
Copenhagen, 22 18
St. Petersburg, 67 12
" 20 4
Gothenburg, 10 3
Christiania, 22 1
Copenhagan, 24 10
Konigsberg, 10 1
Rotterdam, 4 12
" 22 2
Antwerp, 24 8
" 10 2
Hamburg, 17 18
Borax—
Ergastiria, 1 c.
Caustic Soda—
Riga, 10 t. 4 c.
Copenhagen, 3 11
San Francisco, 72 10
Christiania, 8 8
Odessa, 7 5
Antwerp, 10 4
Hamburg, 17 19
Barcelona, 30
Copenhagen. 2 4
Gutta Percha—
Bilbao, 2 c.
Litharge—
Copenhagen, 1 t. 4 c.
" 5
Gothenburg, 1 2
Magnesia—
Hamburg, 15 c.
Barcelona, 10 t. 9
Plumbago—
Ergastiria, 4 c.
Potassium Chlorate—
Antwerp, 22 t.
Hamburg, 11
Rotterdam, 1
Pitch—
Riga, 10 t.
Soda—
Aalborg, 9 t. 16 c.
Horsens, 15 14
Odense, 10 15
" 6 5
Fredericksbawn, 5 18
Copenhagen, 32 1
" 4 8
Rotterdam, 28 11
Soda Ash—
Libau, 10 t. 4 c.
Odessa, 11 5
Christiania, 5 2
Konigsberg, 272 4
Gothenburg, 19 19

Sodium—
Hamburg, 2 cs.
Sodium Sulphate—
Barcelona, 8 c.
Konigsberg, 20 t. 8
Gothenburg. 10 12
Sodium Hyposulphite—
St. Petersburg, 4 t. 19 c.
Sodium Chlorate—
Hamburg, 10 t. 1 c.
Rotterdam, 1 13
Sulphur—
Helsingborg, 9 c.
Superphosphate—
Libau, 448 t. 10 c.
Riga, 921 19
Helsingborg, 1,025
" 150

HULL.

Week ending August 12th.

Alkali—
Fiume, 8 cks.
Libau, 200 kgs. 34 drums.
Naples, 19 cks.
Odessa, 25
Riga, 104 295
Trieste, 10
Venice, 16
Barytes—
Stettin, 100 t.
Bleaching Powder—
Danzig, 5 cks.
Leghorn, 30
Riga, 33
Rotterdam, 36
Stettin, 399
Brimstone—
Christiania, 146 bgs.
Caustic Soda—
Bari, 69 drums.
Christiania, 10 1 cs.
Danzig, 54
Konigsberg, 18
Libau, 129
Venice, 50
Chemicals *(otherwise undescribed)*
Antwerp, 74 cks.
Abo, 10
Amsterdam, 4
Alexandria, 12
Bremen, 37 2 cs.
Christiania, 11
Danzig, 113 70 pks. 172 slbs.
Dunkirk, 8
Drontheim, 12
Gothenburg, 10 11 cs.
Genoa, 29 19
Hamburg, 9 350bgs. 73 88
Harlingen, 80
Konigsberg, 24 10
Libau, 129 drums.
Leghorn, 62 cks.
Marseilles, 25 35 cs.
Nicolauff, 40
Naples, 6 10 pks.
Odessa, 12 100
Riga, 11
Rotterdam, 252 27 cs.
Rouen, 20
Stettin, 17
St. Petersburg, 20 100 50 cs.
Stockholm, 3
Trieste, 3 1
Uleaborg, 95
Dyestuffs *(otherwise undescribed)*
Antwerp, 1 ck.
Hamburg, 4
Rotterdam, 5 2 cs.
Stettin, 178 bgs.
Manure—
Antwerp, 100 bgs.
Danzig, 300
Dunkirk, 66
Esbjerg, 3,594
Libau, 5,588
New York, 469
Stettin, 460
Pitch—
Antwerp, 60 t.
Genoa, 10 cks.
Venice, 450
Tar—
Antwerp, 2 cks.
Christiania, 6
Gothenburg, 151
Genoa, 125
Hamburg, 2 1 cs.
Stettin, 5
Rouen 2

GRIMSBY.

Week ending August 9th.

Coal Products—
Dieppe, 123 cks.
Chemicals *(otherwise undescribed)*
Dieppe, 21 cks. 150 pks.

GOOLE.

Week ending August 6th.

Alkali—
Dunkirk, 30 cks.
Benzole—
Antwerp, 48 cks.
Dunkirk, 25
Rotterdam, 20
Coal Products—
Dunkirk, 25 cks.
Ghent, 19
Chemicals *(otherwise undescribed)*
Ghent, 3 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 1 ck. 3 cs. 3 drs.
Ghent, 1 5
Manure—
Boulogne, 42 bgs.
Dunkirk, 170
Hamburg, 572
Jersey, 1,350
Esbjerg, 3,994
Pitch—
Venice, 380 t.
Antwerp, 99

GLASGOW.

Week ending August 14th.

Ammonium Sulphate—
Philadelphia, 41 t. 4¼ c. £450
New York, 50 19 600
Nantes, 25 13¾ 300
Ammonium Carbonate—
Christiana, 2 cks. 5 kgs. £20
Alkali—
Danzig, 439 c. £114
Bones—
Antwerp, 10 t. 1¾ c. £55
Benzole—
Dieppe, 32 pns. £324
Charcoal—
Dieppe, 175 c. £10
Dyestuffs—
Extracts
Montreal, 66½ c. £93
Glucose—
Cape Town, 6 t. 6¾ c. £115
Naphtha—
Rouen, £700
Pitch—
Calcutta, 173 c. £25
Quebec, 47 t. 10¾ £83
Potassium Bichromate—
Nantes, 5 t. 9½ c. £190
Rotterdam, 130 cks. 933
Oporto, 5 3 180
Venice, 23¾ 35
Rouen, 72 17½ 2,289
Antwerp, 121 176
Quebec, 83 145
Danzig, 504¼ 23 lbs. 774
Stockholm, 3 cks. 40
Potassium Prussiate—
New York, 4 t. 17 c. £337
Rouen, 16¼ 50
Paraffin Wax—
Antwerp, 1 t. 17 c. £54
Sodium Bichromate—
Nantes, 14½ c. £20
Venice, 22 30
Rouen, 12 t. 1 303
Quebec, 64 c. £82
Antwerp, 5 t. 10¾ 120
Sodium Nitrate—
Fiume, 10 t. £87
Tar—
Stockholm, 20 brls. £6

PRICES CURRENT.

WEDNESDAY, August 20, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/-	&	12/-
,, Glacial .. .. ,,			64/-
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3½
Picric .. .. ,,	0	1	0½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/-	&	35/-
,, Nitrate .. . . per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	12	6
Aniline Oil (pure) .. .. per lb.	0	0	11
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/-	to	75/-
Bleaching Powder, 35 % .. .. ,,	5	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	11	10	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6	to	35/-
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	4
Benzol, 90 % nominal .. .. .. per gallon	0	4	3
,, 50/90 ,, ... ,,	0	3	2
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7¼
,, (crude 60°) .. .. per gallon	0	2	0
Creosote (ordinary) .. .. ,,	0	0	2½
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. ,,	1	5	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	59	7	6
,, Sulphate .. .. ,,	18	10	0
,, Oxide (copper scales) .. .. ,,	52	10	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. . . ,,	7	2	6
,, ,, (grey) .. .. per ton	12	10	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/-	&	42/6
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	6
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	22	15	0
,, ,, (Caustic Potash) 75/80 % .. ,,	21	15	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	0	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	6
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	0	0
,, ,, (Soda Crystals) .. .. ,,	3	0	0
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	11	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	11	0	0
,, ,, (70 % Caustic Soda) ,, .. ,,	10	5	0
,, ,, (60 % Caustic Soda) .. .. ,,	9	5	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	0	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	3
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8
,, Barium, 95 % .. .. ,	0	0	5½
,, Potassium .. .. ,,	0	0	8¼
Sulphur (Flowers) .. .. per ton.	8	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	98	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	15	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	5	0

THE

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THE CHEMICAL UNION.

THE Chemical Union, "will it go?" ask several of our correspondents, who are interested in the purchase of alkali and bleach. To the foregoing question, we are fain to reply—we don't know—though the impossibility of inducing alkali makers in the past to come to some common understanding among themselves, does not inspire us with too much confidence in the present movement.

We have often in these columns pointed out that the user of any manufactured article has no right to expect the producer to sell it to him at less than its cost price. Competition and cheapness are all very well in their way, but capital does not care to be extinguished, and losses in manufacturing generally end in a diminution of the workmen's wages, until, when the losses are too great, the capital is withdrawn, if it can be, and the workman is left to starve.

We are not believers in excessive cheapness. Excessive cheapness means waste in the long run—waste of time, waste of money, and waste of energy in producing something which actual practice has shown is not required.

But in many of our large chemical undertakings, the capital invested is now almost entirely represented by land and buildings and complicated chemical machinery in full working order; and those familiar with this class of plant, know fully well that it must be kept at work, otherwise the deterioration is tremendous.

This explains, to a considerable extent, why it is that chemical products have continued to fall in value. Everyone has endeavoured to work to the full, in order to keep down the general expenses to the lowest possible limit per ton of product; more has been produced than required; and, as a consequence, chemicals have been used with a degree of prodigality that must, in the end, demoralise any industry.

To take a case—one factory using eleven tons of bleaching powder weekly, was appalled by bleach rising from £4. 15s. to £7. per ton, and upon investigation it was found that four tons per week were being wasted and turned into the nearest stream. This would never, perhaps, have been discovered had bleach remained at its low price. The weekly purchase of this mill is now seven tons a week, instead of eleven.

It has long been known that the prices at which alkali has been sold have been unremunerative. Ever since the establishment of the ammonia-soda industry, in this country, ammonia-soda has controlled the price of soda ash and the alkali makers have been slow to recognise that the manufacture of carbonated alkali must sooner or later fall entirely into the hands of the ammonia-soda works. This is not the case however, with caustic soda, at least for the present, and bleaching powder has not yet become an established manufacture in the ammonia-soda works, so that the whole of the world's requirements are to-day provided by the existing Leblanc works.

Sir Edward Sullivan, in a recent letter to the *Liverpool Courier*, points out that the practice of the proposed Union is to be "Defence — not Defiance." It is absurd to think that any trade will continue for long to be satisfied in receiv-

ing the minimum of profit, even if not actually involved in loss, and those who are so actively opposing the formation of a Chemical Union seem to forget that the operation of driving out half the existing producing power would land them in a more terrific plight than the formation of a Union could ever do.

The greatest oponents to the Chemical Union are to be found amongst the paper makers, and it is gravely hinted that if the Union proceeds, the papermakers will combine to erect works of their own. We have an instance before us of a papermaker, who, not satisfied with the profits of his legitimate calling, ventured into the mystic circle of chemicals, and from what we have heard for some years, he would be immensely pleased if he could break the chemical bonds which now enthral him.

If paper makers believe that the Chemical Union will net too much profit, it is open to them to take up the shares, and if they have to pay more for their bleach, some of it at least will be returned to them, in the shape of dividends, from the Union.

If the Chemical Union is formed, and we see no reason why it should not be, it will not have our sympathies unless it is run on very liberal lines. If a moderate dividend is secured to the shareholders, say 10 or 12 per cent. per annum, we do not think the consumers of bleach should grumble. The legislature has already established a precedent, as to what is a fair and reasonable dividend for gasworks to pay, and we see no reason why such a complicated business as a chemical works should be expected to return less to the holders of its shares.

Of course, much will depend upon the reasonableness of the valuation of each individual works entering the Union, and, so far as we have heard, the demands are reasonable. This being conceded, the next step is to ensure that prohibitive prices are not charged for the products. The Constructive Committee have, we understand, proposed rates for next year's contracts, and, with one single exception, they are, we think, permissible. Bleach has been fixed at £6., and 70 per cent. caustic at £10. 10s., but muriatic acid has been unwisely priced at 10d. per carboy.

We can well understand the anxiety of chemical manufactures to prevent chlorine users from procuring muriatic acid at such a rate as would enable them to prepare their own chlorine from it, but they need not alarm themselves on this point. What they have to fear is either the partial displacement of muriatic acid by oil of vitriol, or, what is worse the production of additional muriatic acid by firms using large quantities, in which case more saltcake will be brought into the market, a circumstance it is certainly inadvisable to bring about.

The future price of bleach has been fixed low, probably on account of the several rumours that much cheaper sources of chlorine may be launched on the market at any time, and here the papermakers may find much consolation. They may rest assured that any inordinate price for bleach, or extreme profits from the Union will only stimulate the appetite of the inventor, and if the papermakers combine to erect works of their own, they may find some morning they have a "white elephant" that will feed gaily on the capital they may have been foolish enough to sink therein.

The policy of the Union should be, to rest satisfied with selling bleach and caustic at the prices they have fixed, but if they raise the price of "salts," they will certainly reduce the consumption. The Union should rather endeavour to increase the consumption, so as to relieve themselves from the necessity of either making less saltcake, or more bleaching powder than the demand calls for. It is certain that either of these ways would be prejudicial to the Union, and there is not the slightest doubt that the demand for muriatic acid will increase if it be cheap enough to keep the oil of vitriol out of use for many purposes for which either acid may be employed, and every bottle of vitriol displaced by a bottle of "salts" means a corresponding relief to the bleach market, unless the Union adopt the barbarous plan of running their surplus acid into the river, as the works have not infrequently done aforetime.

The Union should be satisfied in obtaining for its muriatic acid, the same price per carboy that it would realise if made into bleach, and by doing so they will be keeping in the middle of the track. As we have already pointed out, a moderate profit will enable the Union to remunerate its workmen more liberally than the trade has been able to afford for many years.

The operations of alkali making are by no means so pleasant as in the works where bleaching powder is used. The following woodcut shows a bleach-packer in his working costume.

We recommend a glance at it to those who are opposing the Union, and venture to suggest that if they deem the occupation an ordinary one—a calling to be remunerated by ordinary pay, that they try their 'prentice hands at the work, when we have no doubt they will come to the conclusion that "every man to his trade" is the best policy to adopt, even if enhanced prices result from the pragmatical situation.

Sulphur Compounds in Raw Petroleum and Petroleum Residues.—It is not generally known that many varieties of petroleum, for instance that obtained from the Ohio wells, contain considerable quantities of sulphur compounds. These sulphur compounds mostly have high boiling points and are present in largest proportion in those fractions of the oil which boil between 200° and 300° C. Sulphur compounds can be extracted from petroleum oil by the following process, which is recommended by Mabery and Smith in the *Berichte der Deutschen Chemischen Gesselschaft*, vol. XXII., p. 3303. The oil is first treated with concentrated sulphuric acid; the acid solution is then diluted and neutralised either with carbonate of lead or chalk. On evaporating down a salt gradually separates out from the solution. This salt is collected and washed, after which it is subjected to distillation with steam, and this causes the sulphur compounds to pass over into the receiver, when they collect in the form of a pale yellow oil containing 14·97 per cent. of sulphur. The compounds can be separated from each other by fractional distillation.

A METHOD OF EXAMINING COLOURS STATED TO BE FAST TOWARDS LIME AND SUNLIGHT.

By H. Stössel.

MANY so-called aniline lakes, *i.e.*, mineral substances upon which aniline colours have been precipitated and fixed, have recently come into the market. These body colours, which are usually of brilliant shades, are credited by the small manufacturers with many properties, which they do not by any means possess, and the purchasers are thus frequently deceived. One of the most important of these is their resistance to the action of alkalies, and another, their permanence towards light and especially sunlight. Both these properties are of exceptional importance for these colours, which are chiefly used for wall decoration, distempering, carpets and coloured papers, and it, therefore, appears admissible to lay down, as far as possible, definite rubs for testing the various colours in question. I would, therefore, recommend the following method, which proves to be simple and practically convenient :—

To test the stability of the colour towards alkali, it is best to use normal caustic soda solution (Sp. gr. 1·046 at 15° C.), allowing 10 c.c. of this solution to act on 1 grm. of the colour for six hours, after shaking up the whole. At the end of this period, any colour which cannot resist lime is, if not entirely destroyed, at all events considerably weakened.

A comparative test should be made with a sugar solution of the same specific gravity, under exactly the same conditions. A comparison of the two samples at the end of the six hours will lead to the detection of the least alteration in shade.

Although milk of lime, as usually employed, is always much more strongly basic than normal caustic soda solution (one sample was four times as strongly alkaline), it is quite unnecessary to employ such a strong solution for the test, since all colours which ought to be excluded from the uses named above are attached by normal caustic soda.

To test the stability of the colour towards light, it is spread out on a plate, one portion being exposed to the sunlight, and the other protected by a piece of opaque paper, the whole being covered by a glass plate. If the colour is at all fugitive, a distinct difference will be perceptible between the exposed and unexposed portions after six hours.

This simple experiment is quite sufficient to determine whether the supposed "light proof" colour can actually claim the title.—*Chem. Zeit.*

ARTIFICIAL MANURES IN FRANCE.

THE British Consul at Nantes, in the last report on the agriculture of his district, has some observations of value to British manufacturers of artificial manures. A law of 1884, on professional and agricultural syndicates, and one of 1888, for the repression of frauds in the manure trade, were passed for the protection of agriculture. Both tend to free cultivators, particularly those carrying on "la petite culture," by far the most numerous class, from the shameful practices of unscrupulous merchants. Formerly samples of manure with high-sounding names were exposed at exhibitions and agricultural meetings in the country, but no indication was given of their components and real value. The discredit so long attached to chemical manures is mainly attributable to the deceptions and consequent losses to which cultivators were subjected. The exhibition of 1889 materially modified this state of things, for, owing to progress in the science and art of agriculture, and to the provisions of the law of 1888, the manure trade was represented by exhibits with analyses of their composition, the accuracy of which was guaranteed by the manufacturer. There are many firms of undoubted respectability in the trade; but, owing to the small quantity of manure required by peasant proprietors and small tenants, they find it impracticable to obtain it direct from works at a distance, as they would have to pay not only retail prices, but also a heavy rate of carriage by rail. Thus they become the dupes of swindling commercial travellers, who swarm over the country during winter and spring, and skilfully manage to evade the provisions of the law. As a remedy for this state of things, agriculturists are urged to eschew resolutely all transactions with commercial travellers, and to apply for their requirements to the nearest agricultural syndicate. These syndicates are spreading rapidly all over France, and in January, 1889, numbered 557. They are in a position to purchase manures wholesale from respectable houses, who, in conformity with the law of 1888, guarantee the accuracy of the analysis of their products. Moreover, as the orders are executed by wagon-load, a considerable economy is effected in railway carriage. "British manufacturers who are prepared to sell their manures on similar terms, and also manufacturers of agricultural implements, would do well to place themselves in communication with these syndicates."—*Times*, Aug. 11.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Buckley.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

Chadderton Iron Works Co., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, Plaistow, Essex.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

Galloways, Limited, Manchester.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co. Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters

Joseph Kershaw and Co., Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Meldrum Bros., Manchester.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.—Pumping Machinery. Speciality, their "Duplex" Pump.

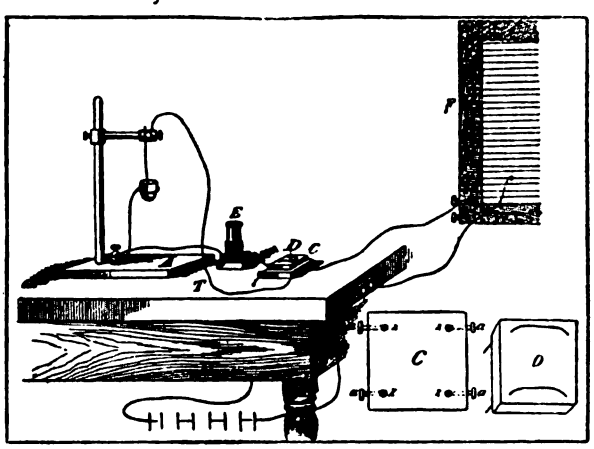
Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

THE OXIDATION OF SULPHIDES BY MEANS OF THE ELECTRIC CURRENT.

By Edgar F. Smith.*

In the proceedings of the Chemical Section of the Franklin Institute, 1·52, and the *Berichte*, 22,1019, a preliminary report was published, describing a rapid method for the conversion of sulphur into sulphuric acid, through the agency of the electric current. It was there demonstrated that the sulphur in the mineral chalcopyrite, for example, was completely oxidised into sulphuric acid in ten minutes, and that the oxides Fe_2O_3, Cu O, etc., were eliminated from the analysis, so that the barium sulphate finally weighed, was perfectly white in appearance, and not contaminated with the impurities usually accompanying it when precipitated from solutions containing much iron.

To give a better idea of the mode of carrying out an oxidation of this description, the apparatus used for this purpose will be first outlined. T represents a table upon which stands A, an ordinary filter stand, in the base of which is fixed a binding screw, holding in position a heavy copper wire, bent as seen in sketch and intended to carry the nickel crucible in which the oxidation occurs. The arm of the filter stand has attached to it a binding screw holding a heavy platinum wire, as well as the copper wire, generally in connection with the anode of the battery.



E is a Kohlrausch ampèremeter, registering ampères and half ampères; this is in connection with *C*, a block of wood screwed or nailed to the table. There are four depressions (*x*) in *C* containing a few drops of mercury, in contract with the binding screws (*a*). *D* is the movable top of *C*; the wires crossing it project on the under side and rest in the mercury cups (*x*). When *D* is so arranged that the wires on its upper face run in the direction of the dart, the crucible becomes the anode of the battery, whereas if they have a horizontal position, ——> the crucible is the cathode.

F is a resistance frame, consisting of about 500 feet of common iron wire arranged upon a light wooden parallelogram. It should always be in the circuit.

The movable cap *D* is necessary and important. It enables the operator to change the poles quickly—to reverse the current at a moment's notice. In the oxidations to be described later on, this was frequently necessary, chiefly because when the crucible served as cathode in many of the decompositions there often occurred a considerable deposition of metal upon its sides, and in the act of separating this metal enclosed undecomposed material and withdrew it from the field of oxidation. In such cases, by making the crucible the anode, as above indicated, the mineral matter will be liberated, and upon coming in contact with a large oxidizing surface, all the sulphur contained in it will be converted into sulphuric acid. The crucible should always be covered during the oxidation.

OXIDATION OF THE SULPHUR IN SULPHIDES.

In the oxidations given later, nickel crucibles 1¼ inches high and 1⅜ inches wide were used; but a more advantageous form, one which should always be employed when more than 0·15 gram of material is used, would measure two inches in length and 1½ inches in width. In such a vessel, place 25—30 grams of pure potassium hydroxide (not sodium hydroxide), and warm the same until the excess of moisture is expelled. Bring the weighed sulphide into the crucible, connect the latter with the copper wire shown in the sketch, and lower the platinum wire so that it extends a short distance below the surface of the molten mass. The current is then made to pass, by bringing a metallic cup, connected with one pole of the battery, in contact with one of the wires of the resistance frame *F*. The sulphur will be completely oxidised in from ten to twenty minutes. Interrupt the current, allow the crucible and contents to cool, then place the same in water. In a few minutes, all but the insoluble oxides will have dissolved. Filter, acidulate the warm filtrate with hydrochloric acid, and precipitate the sulphuric acid in the usual manner. If, upon adding acid to the alkaline solution the latter becomes turbid, from separated sulphur, it is an indication that the oxidation was incomplete. Observe closely whether sulphur dioxide is liberated, even when the liquid remains clear. Never omit the examination of the residue remaining on the filter, after the alkaline solution has been filtered The caustic alkali must always be tested for sulphur before using it in this work. It is well to estimate the impurities in the alkali, and deduct them, in each determination, from the barium sulphate found.

To ascertain to what extent this method could be applied in oxidising sulphur, the following minerals, representing all the various classes of natural sulphides, were subjected to experiment:

SPHALERITE (ZnS).

No difficulty was experienced in oxidizing the sulphur of this mineral. A current of one ampère (=10·45 cc. electrolytic gas per minute) was amply sufficient for the purpose. When the mineral was added to the melted caustic potash and the current applied, the mass assumed a muddy appearance, which it retained for ten minutes, when it became white and froth-like. It was discovered, by experiment, that this appearance indicated the complete oxidation of the sulphur.

(I) 0·1195 gr. mineral, 20 gr. alkali, 1 ampère (time, 20 min.), gave 32·97 per cent. S.
(II) 0·1025 " " " " " 32·96 "
(III) 0·1180 " " " " 10 " 32·80 "

By oxidizing the sulphur in a fourth portion with nitric acid and potassium chlorate, 32.90 per cent. sulphur was obtained.

A specimen of Joplin (Mo.) blende gave 32·60 per cent. and 32·80 per cent. S. by the nitric acid method, while by the electrolytic method 32·90 per cent. S. was found.

An impure sphalerite, locality unknown, in which there was considerable gangue and other admixtures, gave 29·8 per cent. S. when oxidized with nitric acid, and when acted upon in alkaline solution by a current giving one ampère of electrolytic gas per minute, the sulphur found was:

(I) 29·23 per cent. S.
(II) 29·45 " "
(III) 29·68 " "
(IV) 29·67 " "
(V) 29·90 " "
(VI) 29.58 " "

CINNABAR (HgS).

Very pure material was employed in this oxidation. Several trials were required, in order to learn the proper conditions for successful working. The tendency of this mineral, when finely divided, was to collect in lumps, which appeared to rise and fall in the alkaline solution; in order to bring every particle of material within the field of oxidation, the current was reversed every few minutes. By doing this, the sulphur was completely oxidized in twenty minutes or even in less time. If the precaution just mentioned with reference to the reversal of the current be not heeded, more time will be required for complete oxidation and even then it will be doubtful whether the sulphur is fully converted into sulphuric acid. Twenty-five grams of caustic alkali were used in each experiment with this mineral.

0·1089 gram cinnabar gave 13·82 per cent. S., while the required percentage is 13·79.

A current of two ampères per minute was used.

GALENITE (PbS).

There is no difficulty in oxidizing this mineral. The same quantity of alkali and the same current strength were employed here as in the mineral immediately preceding:

(I) 0·1093 gram galenite gave 14·30 per cent. S.
(II) 0·1092 " " 14·60 " "

Another portion in which the sulphur was oxidised by heating the mineral in a current of chlorine gave 14·30 per cent. S.

ARGENTITE (Ag_2S).

No difficulty was encountered in oxidizing this mineral. The decomposition was made with conditions analogous to those already described. Silver did not pass into the alkaline solution, so that when the sulphuric acid was precipitated, barium chloride was employed as usual. The specimen analyzed being exceedingly pure, it was not thought necessary to determine the sulphur by any other method. None of it remained unoxidized:

*Paper read before the Chemical Section of the Franklin Institute.

0·1032 gram argentite gave 13·04 per cent. S.; required 12·90 per cent. S.

CHALCOCITE (Cu_2S).

Thus far this mineral has resisted all efforts to convert its sulphur into sulphuric acid. Repeated attempts have been made, but not more than half of the sulphur contained in the mineral was oxidized, notwithstanding the current was very much increased in each trial. Since some time may elapse before another opportunity offers itself to continue experimentation with this mineral, it need only be stated that a modification of the usual method will be tried upon it. The copper and sulphur are evidently in very intimate union.

MOLYBDENITE (MoS_2).

The sulphur in this mineral is given up readily to the oxidizing influence of the current. One annoying feature is that the fine mineral particles are so very light that they are apt to be carried up and adhere to the cover crystal. In this oxidation the poles should be repeatedly reversed. The result given below is from a sample that contained much quartz, etc. The residue, however, gave not a trace of sulphur when tested for it.

0·1045 gram mineral gave 0·2785 $BaSO_4$ = 36·60 per cent. S.

STIBNITE (Sb_2S_3).

While a current of two ampères was employed in this oxidation, the sulphur can be completely changed to sulphuric acid with one ampère. Three trials proved this conclusively.

0·1095 gram mineral gave 0·2230 $BaSO_4$ = 27·91 per cent. S.; required sulphur, 28·5 per cent.

ORPIMENT (As_2S_3).

Pure material could not be obtained, so that the experiments were made with inferior mineral, and the greatest care was given the oxidation, so that sulphur was not afterwards discovered in the insoluble residue.

0·1150 gram sub. gave 0·2922 gr. $BaSO_4$ = 34·90 per cent. S.
0·1044 ,, ,, 0·2721 ,, = 35·79 ,, ,,

The arsenic was also oxidized to arsenic acid. Several tests proved the conversion to be quantitative. Results obtained in this direction will be published later.

JAMESONITE ($Sb_2S_5Pb_2$).

The sulphides of lead and antimony offer no difficulty in the oxidation of their sulphur. This sulpho-salt is decomposed with equal facility. A current of two ampères per minute was employed. The crucible was the anode for ten minutes, and the cathode for an equal period.

(I) 0·1078 gram mineral gave 0·1426 gr. $BaSO_4$ = 18·16 per cent. S.
(II) 0·1093 ,, ,, 0·1447 ,, = 18·18 ,, ,,
Required S = 18·30 per cent.

ENARGITE (AsS_4Cu_3).

The oxidation was made in the same manner as in jamesonite:

0·1102 gram mineral gave 0·2449 gr. $BaSO_4$=30·52 per cent. S.

A second sample, oxidized with nitric acid, gave 31·00 per cent. S.

STEPHINITE (Ag_5SbS_4).

This mineral was oxidized without difficulty. The conditions under which it was worked were similar to those of the preceding minerals:

(1) 0·1044 gram substance gave 16·69 per cent. S.
(11) 0·1109 ,, ,, 16·55 ,,
Theory req. 16·20 p.c.S.

KOBELLITE ($(Bi\ Sb)_2\ S_5\ Pb_2$).

The sulphur in this mineral was oxidised with ease:

(I) 0·1136 gram sub. gave 0·1562 gr. $BaSO_4$=18·38 per cent. S
(II) 0·1157 ,, ,, 0·1594 ,, =18·41 ,,

The sample here oxidized was of the same material as that analysed by Dr. Keller (*Proc. Chem. Franklin Soc. Inst.*, 1, 127). On comparing the means of his four sulphur determinations with the results obtained by the electrolytic method, it will be seen that the latter does not lack in completeness:—

Current Oxidation.	*Nitric Acid Oxidation.*
Sulphur percentage.	18·37, 18·33, 18·46, 18·39.
18·38—18·41.	Mean, 18·39 per cent. S.

TETRAHEDRITE $(Sb,As)_2S_7(Cu_2,Hg,_2Fe,Zn)_4$.

Quite a number of sulphur determinations and complete analyses of tetrahedrite of the above composition were made in this laboratory during the college year just closed. In all of these the chlorine method was employed for decomposition purposes. The percentage of sulphur found was 24·48 per cent. Samples of the same were then exposed to the action of a current of two ampères for twenty minutes, and the sulphuric acid determined in the usual manner with these results:

(I) 0·1073 gr. mineral gave 23·81 per cent. S.
(II) 0·1096 ,, ,, 24·38 ,,
(III) 0·1086 ,, ,, 24·23 ,,
(IV) 0·1095 ,, ,, 24·37 ,,

Tetrahedrite seemed to require the full time (twenty minutes) for oxidation, for in several instances, where the current was interrupted after acting fifteen minutes, the alkaline solution became quite turbid upon acidulation.

STANNITE (SnS_4Cu_2Fe).

The conditions here were the same as those already mentioned for the other sulpho-salts,

(I) 0·1087 gram mineral gave 28·61 per cent. S.
(II) 0·1091 ,, ,, 28·02 ,,

PYRRHOTITE ($Fe_{11}S_{12}$), MARCASITE (FeS_2) AND PYRITE (FeS_2).

The sulphur in the first of these three minerals is very readily changed to sulphuric acid. None of its iron passes into solution, so that the barium sulphate, after ignitation, was perfectly white in colour. The residue, not soluble in water, showed no unoxidized sulphur:

(I) 0·1087 gram mineral gave 0·3049 gr. $BaSO_4$=38·51 per cent. S.
(II) 0·1067 ,, ,, 0·3014 ,, =38·79 ,,

By oxidation with nitric acid the sulphur found was 38·78 per cent S.

An exceedingly pure specimen of marcasite was exposed to the action of the current. Its sulphur was rapidly and completely oxidized.

0·1043 gram substance gave 0·4056, gr. $BaSO_4$=53·40 per cent. S. Required S.=53·33 per cent.

While these sulphides of iron parted with their sulphur with great ease, pyrite held half of its sulphur content quite tenaciously, notwithstanding it was exposed to the influence of much more powerful currents than the other two minerals.

(1) 0·1667 gram pyrite and 20 gram. KOH was exposed for ten minutes to the action of a current giving one ampère per minute. The crucible served as anode for half the time. The sulphur that was oxidised equalled 24·53 per cent.

(II) 0.3080 gram pyrite, 30 grams KOH, and a current as in (1) gave 22 per cent. S.

A number of similar trials gave about the same results. As chalcopyrite was oxidised without difficulty (*Proc. Chem. Sec., Franklin Institute*, 1, 53), the thought suggested itself that possibly the addition of cupric oxide might prove beneficial. Accordingly, the following experiments were made:

(III) 0·1009 gram pyrite, ·0611 gram CuO, 25 grams KOH, and a current of one and one-half ampères gav e 36·39 per cent. S.

(IV) 0·1021 gram pyrite, ·0710 gram CuO, 25 grams KOH, and a current of one and one-half ampères gave 35·02 per cent. S.

(Y) 0·1007 gram pyrite, ·0550 gram CuO, 25 grams KOH, and a current of one and one-half ampères gave 30·93 per cent. S.

The time in each trial was twenty minutes. While the addition of the cupric oxide apparently favours the sulphur oxidation, the results are anything but concordant.

(VI) 0·1000 gram pyrite, ·0950 gram CuO, 25 grams KOH, with a current of two ampères, for twenty minutes, gave 51·24 per cent. S.

(VII) 0·1000 gram pyrite, 0·1000 gram CuO, and other particulars the same as in (VI), gave 38·00 per cent. S.

The residues all contained unoxidized sulphur.

(VIII) 0·1045 gram pyrite, ·0523 gram CuO, 25 grams KOH, and a current of two and one-half ampères per minute, gave 46·93 per cent. S.

(IX) 0·1000 gram pyrite, ·0500 gram CuO, otherwise as in (VIII), gave 46·97 per cent. S.

(X) 0·1123 gram pyrite, 0·1400 gram CuO, 25 grams KOH, and current of two and one-half ampères, gave 41·67 per cent. S.

(XI) 0·1160 gram pyrite 0·1100 gram CuO, 25 grams KOH, and a current of two and one-half ampères, gave 51·26 per cent. S.

These examples are but a few of the many trials carried out to obtain all the sulphur. The final satisfactory results were obtained in the following manner:

(XII) 0·1060 gram pyrite, an equal quantity of cupric oxide, 28 grams KOH, and a current of four ampères per minute, gave 53·6 per cent. S.

The residue remaining, after treating the fused alkaline mass with water, was dissolved in nitric acid, diluted to 75 cc. with water, and tested with a solution of barium chloride. No barium sulphate was

precipitated on warming the solution, or even after allowing the same to stand for some days.

(XIII) 0·1048 gram pyrite, an equal quantity of cupric oxide, 28 grams KOH, and the current as in the preceding experiment, gave 53·02 per cent. S.

The residue did not contain sulphur. The time given for the oxidation in each of these experiments was twenty minutes, and the current was reversed after it had acted ten minutes.

Several trials were made with the view of ascertaining whether with conditions precisely analogous to those in the last two experiments, the copper oxide omitted, it would be possible to completely oxidise all of the sulphur. They proved failures. A current of five ampères, with cupric oxide absent, was insufficient for the complete conversion of the sulphur into sulphuric acid.

The sulphur of pyrrhotite was readily oxidized. Indeed, this mineral conducted itself very much like the monosulphides, zincblende, galenite, etc. Marcasite, too, offered no difficulty. Since it and pyrite differ only in crystalline form, can it be that the latter property alone is the cause of the greater stability of the pyrite? Will this explain its tenacious hold upon the sulphur? If this be true, why should not this stability extend to the two sulphur atoms? More than forty trials with pyrite show that it is only about half the sulphur which the current changes to sulphuric acid. At least such was the case when cupric oxide was not added. The same current strength that does this amount of oxidation with pyrite will convert *all* the sulphur in marcasite into sulphuric acid.

The writer would here acknowledge his indebtedness to Profs. Koenig and Keller for the mineral material consumed in this investigation, and also to Mr. D. C. Wallace for most valuable assistance in carrying out the oxidations and general analytical work.

THE PROPOSED NEW RAILWAY RATES AND CHARGES.

A CORRESPONDENT in the *Manchester Guardian* says that the agitation occasioned in the railway and commercial world by the proposed schedule of railway rates and charges increases the more the various results are worked out, and the document is not regarded by either side as forming a basis for future proceedings. Amongst the points upon which further controversy may be anticipated are the following:—

In the case of coal traffic the proposal of the London and North-Western Company was to maintain the existing maximum rates, which in respect of the volume of traffic were the actual rates. These rates, applicable to their main line and lines in Lancashire, are one penny per ton per mile for distances not exceeding 50 miles, and three farthings per ton per mile for distances above. This proposal met, it is alleged, with the approval of the bulk of those interested, yet notwithstanding this the scale of rates suggested will be below the present actual charges—a result that to the trader will probably be an interesting surprise. In other cases it is maintained that the proposals will involve reductions similar in principle though less in degree. In fact, the companies assert that the schedule means the confiscation of a great part of their annual revenue and a serious blow to their capital value. The traders, on the other hand, though not so openly demonstrative in their opposition to the new proposals, are by no means pleased with the equity of the agreement proposed. With respect to the vexed question of station terminals, as to the validity of which there has been so much controversy, doubt will be set at rest by the schedule, which expressly provides for their incidence, inasmuch as it enacts that "the maximum station terminal" shall be "the maximum charge which the company may make to a trader for the use of the accommodation exclusive of coal drops provided, and for the duties undertaken for which no other provision is made in the schedule by the company at the terminal station for or in dealing with merchandise as carriers thereof before or after conveyance."

The actual charges suggested in the schedule as compared with those proposed by the railway companies are, for class A, a maximum charge of 6d. at each end, as compared with 6d. and 8d. asked by the companies; class B, 9d., as compared with 9d. and 1s. asked by the companies; class C, 1s., as compared with 1s. 3d. and 1s. asked by the companies; and classes 1 to 5, 1s. 6d., as compared with 1s. 6d. and 2s. asked by the companies. In the cases where the companies suggested two amounts it was done to differentiate between the smaller and larger towns. This is, of course, an important section of the schedule, about the justification for which the traders may be likely to have a good deal to say when the matter comes before Parliament. The "service terminals" fixed are about half those suggested by the companies. As to class rates, the Board of Trade proposals may perhaps best be conveyed by a comparison of existing with proposed charges. Between Manchester and Liverpool, for example, the present rate charged, which includes terminal charges for lots over 11 tons and under 250 tons, are:—Class B, 4s. 2d., proposed inclusive charge 4s. 5d.; class C, present charge 7s., proposed 7s.; class 1, present charge 7s. 11d., proposed 9s. 7d.; class 2, present charge 9s. 2d., proposed 11s.; class 3, present charge 10s. 10d., proposed 12s. 3d.; class 4, present charge 14s. 2d., proposed 14s. 9d.; and class 5, present charge 17s. 6d., proposed 17s. At the present time most of this traffic is carried at special rates which are much below the present actual rates, and the Board of Trade figures, therefore, are enormously in excess of the present actual charges; but the schedule has been framed, of course, to meet the general case. The question of the provision of trucks is settled by a provision that it shall be included in conveyance rate except for goods in class A and for lime or salt in bulk. When traders provide their own trucks a reasonable sum is to be deducted, such amount in case of dispute being settled by the Board of Trade. The goods in class A which are thus exempted have been extended from nine articles to 29, and all these articles, therefore, will come under the lowest powers and enormously affect the revenues of the company.

In this connection it may be here noted that the principle of reducing the earning powers of the companies by the lowering of the classification of goods is everywhere apparent, and it is no doubt in this particular direction that the Board of Trade have striven to effect modifications of the existing conditions rather than in altering the actual rates charged. In relation to the charging of service terminals, the claim of the traders that such services should only be charged for when rendered has been conceded—a distinct advantage gained, as there is no doubt that immense sums have been levied in the past by the companies for these services when none such has been rendered. Charges at private sidings, collection and delivery, weighing and many other minor points are left to be determined between the companies and the trader, with an ultimate appeal to the Board of Trade to fix a reasonable amount if necessary. The minimum short distance chargeable is retained at six miles for goods without station terminal, but is reduced to three miles on other goods. In dealing with the question of overlapping charges the schedule provides that when the distance exceeds 20 miles the company shall not be compelled to charge a less sum than the maximum charge would have been if the distance had been 20 miles, or in other words perpetuates practically the existing system. In respect to the stone and timber trade it is provided that when weight cannot be conveniently ascertained it shall be reckoned at 14 cubic feet per ton of stone and 40 and 50 cubic feet respectively for heavy and light timber. It is further provided that in respect of any article not classified the rates applicable shall be those in class 3, instead of the highest class rates as at present. This is a great concession to the demands of the traders. Returned empties are to be carried at rates not exceeding 75 per cent of the charges for the original carriage of the goods. With respect to the proposed maximum rates, they are in some instances, especially in the higher classes, above the present powers of the London and North-Western Company, whilst in the lower classes they are reduced mainly below the existing lowest powers. These are a few of the more important details of the schedule, which unquestionably bristles with points of friction and controversy.

THE OPAQUE ETCHING OF GLASS.

IN the opaque-etching of glass it has hitherto been thought necessary to use certain expensive fluorine salts in the preparation of the etching solutions. It has quite recently been discovered by A. Lainer that comparatively cheap etching can be prepared. In Dingler's Polytechnisches Journal (vide t. cclxxii. p. 227) Lainer gives two recipes which obviate the use of the more expensive fluorine salts.

I. Two solutions are first prepared: (a) consisting of 10 grms. of soda in 20 grms. of warm water, (b) consisting of 10 grms. potassium carbonate in 20 grms. of warm water. Solution (a) and (b) are now mixed, and to the mixture is added 20 grms. of concentrated hydrofluoric acid, and afterwards a solution (c) consisting of 10 grms. of potassium sulphate in 10 grms. of water is added. II. This recipe contains the following ingredients. 4 cc of water, 1⅓ grms. of potassium carbonate, 0·5 cc of dilute hydrofluoric acid, 0·5 cc of hydrochloric acid and 0·5 cc of potassium sulphate. This mixture is treated with hydrofluoric acid and carbonate of potassium until it produces the required degree of opacity on being tried upon a piece of glass.

Lainer considers that the addition of a small quantity of hydrofluoric acid to solution I. brings about a fine granulated appearance on the surface that is treated with it. But it appears that there is a still simpler process than either of these; it was invented by Herr Kampmann, of Vienna. In preparing an opaque-etching fluid Kampmann uses a wooden vessel, the iron fittings of which are protected from the corrosive action of the acid fumes by a layer of asphaltous material.

This vessel is filled to about one-fifth of its contents with strong hydrofluoric acid, which is then partially neutralized by cautiously and gradually adding some crystals of soda; more soda is added, and the mixture is stirred with a small wooden rod. The point at which the neutralization of the acid should cease is indicated by the mixture frothing and becoming sufficiently viscid to adhere to the stirring rod. It is, perhaps, scarcely necessary to say that the acid fumes are highly injurious, and that this process should be carried on in the open air in order to allow the vapour to pass rapidly away. The most hygienic and satisfactory process of all would be to carry on the operation in a "draught-cupboard."

The contents of this wooden vessel now consist of sodium fluoride and the unneutralized hydrofluoric acid. This mixure is now transferred to a wooden tub and diluted with from five to ten times its volume of water, according to the degree of dilution that is desired. It is objectionable to use this mixture in a too highly concentrated condition, for then the etched surface of the glass is irregular, coarse-grained, and apparantly strewn with tiny crystals; if, on the other hand, the dilution be too extreme, the etched surfaces will be transparent instead of opaque. Either of these two conditions of the etching fluid can easily be remedied, for if it be too strong, water must be added, and if too weak a small quantity of hydrofluoric acid partially neutralized with soda must be mixed in.

A good recipe for preparing a small quantity of this etching fluid is the following: 240 cc commercial hydrofluoric acid, 600 grms. powdered crystalized soda, 100 cc water.

These etching fluids are best used by taking the following precautions. The glass is first thoroughly cleansed from all impurities, and is then provided with a rim of wax composed of the following ingredients: Beeswax, tallow, calophony and powdered asphalt kneaded together. The rim prevents the acid from spreading over those parts of the surface which it is not desired to etch. The glass is now etched for a few minutes with an ordinary etching solution (H.F.—1:10), which is then poured off, the surface being afterwards washed with water and wiped as dry as possible with a piece of sponge.

The surface is now ready for the opaque etching fluid, which is poured on till it forms a thick layer. The operation is allowed to progress for one hour, when the liquid is poured away and the surface washed with water. Water is further allowed to stand on the glass until a thin film of silicate is observed to form; this film is then brushed off and the surface finally cleansed with water and the wax removed.

By varying the action of this opaque etching fluid or paste various degrees of opacity may be produced, and if the opacity be greater than that which is desired the surface can be cleared to an extent by using the etching solution of hydrofluoric acid.

FAST BLUE ON COTTON.

MESSRS. Standant Bros. state that a new fast blue, intended to replace indigo blue, is obtained in the following manner:—

100 kilos of the cotton material are boiled for two hours in a bath made up of 8 kilos. of liquid extract of campeachy wood, and 10 kilos. of salt.

The material is allowed to cool in the bath, removed and passed for a quarter of an hour through a cold bath, containing 10 kilos of ferrous sulphate. It is then rinsed in water, wrung out, and again put into the first bath, to which 2 kilos. of wood extract, and 3 kilos of salt have been added.

Here it is heated to 30°-40° C., and allowed to remain for an hour, after which it is wrung out, and finally passed through a bath of soap and salt. After this, it is passed into the boiling colour bath, which is made up as follows:—

5 kilos. of soap.
5 kilos. of salt or sodium sulphate.
1½ kilos. of colouring matter, special aniline blue.

The material is worked through this bath for an hour, rinsed, wrung, and dried.

In a memorandum, added on November 6th, 1889, the inventors give a receipe for the first bath, which renders their process applicable to thread and linen:

800 grammes of perchloride of iron.
5 kilos. bichromate of soda..
3 kilos sulphuric acid.
7½ kilos. hydrochloric acid.
2½ kilos. aniline oil.

Work for two hours, and afterwards rinse well with water.

Messrs. Standant also state that this third bath may be made up with 2% of blue vitriol.

Our Book Shelf.

THE RIVER IRWELL AND ITS TRIBUTARIES. A Monograph on River Pollution, by George E. Davis and Alfred R. Davis. 96 pp., with map of the whole of the Irwell watershed. John Heywood, Manchester and London. Price *Half-a-Crown*.

This work is the outcome of numerous analyses that have been made in the Manchester Technical Laboratory. It may be that our local authorities have not been severe upon those guilty of polluting the various streams in the watershed, on account of the absence of definite information as to the exact composition of the river water at different points.

It is well known that several authorities have caused analyses to be made of the various parts of the river under their control, but these have been incomplete, and in fact no work, before the one under review, giving a complete account of the watershed, has been accessible to the public.

The book is divided into eight chapters, preceded by a map of the watershed, on which is marked the principal towns, and the position and name of every contributing stream and brooklet of importance.

Following the "Introduction," which gives an accurate account of the Irwell and tributaries, and an explanation of the principal items of the analyses, we find a chapter devoted to the Irwell at Throstle-Nest Weir, which is further summarised on page 22. Then comes the Irwell up stream as Chapter III., in which we find full analyses of the Medlock, Irk, Roch, Croal, Tottington Brook, Holcombe Brook, River Ogden, Limey Water, and Whitewell Brook, taken at their points of confluence with the Irwell. The effect of drought is plainly set out in Chapter IV., a chapter full of interest to sanitarians, especially as regards the table on page 44, where the various tributaries at their points of confluence with the Irwell are compared with the Leeds and Salford sewage.

The Tributaries in Flood form the subject matter of Chapter V., while Chapter VI. is devoted to an analysis of the source of each tributary. Pages 66, 67, and 68 contain three tables, setting forth a comparison of the sources of the various tributaries, with their normal flow at point of confluence with the main stream, showing thereby the extent of the pollution which each has suffered during its flow.

Chapter VII. deals with the various pollutions, while Chapter VIII. describes with minuteness the methods that have been followed in performing the analyses recorded in the work.

The character and condition of a watershed has never been so carefully and minutely described before. If our local authorities and manufacturers have paused for want of information, it is to their hand now, and when they know that the drought flow of the Irk, Medlock, and Tottington Brook is excelled in purity by the Leeds sewage, something may be done to put matters on a more satisfactory basis.

THE PORION EVAPORATOR, for dealing with waste liquids. Manchester: Davis Bros., 32, Blackfriars Street. Price *One Shilling*.

This brochure has been written for the purpose of extending the knowledge of a more economical system of evaporation than is at the present moment in general use.

The Porion system has been applied to many industries on the Continent, but in England it is scarcely known outside of the paper-mills where it has been erected. The authors point out its great use as a smoke washer, whereby a large quantity of the sulphurous acid is removed from the smoke; how it may be employed in woollen mills, to prevent the pollution of the streams by the waste liquors from these factories; in salt works and oxalic acid works, and in numerous other instances.

The authors say that eleven plants are now at work in this country, and over 100 on the Continent, so that the probationary period is passed. They give the following figures to show the money value of the system on a year's working:—

EXPENDITURE:—		REVENUE:—	
Interest on Capital, 5% on £700 ..	£35 0 0	Recovered soda-ash, 1,250 tons at 40 %, equal to 862 tons of 58% soda-ash, at £6. 5s. per ton	£5387 10 0
Depreciation, 10%	70 0 0		
Repairs	125 0 0		
Wages at 6s. ..	375 0 0		
Fuel, 2,000 tons at 8s.	800 0 0		
Balance profit ..	3982 10 0		
	£5387 10 0		£5387 10 0

Everyone having much evaporation to do should read the brochure, which abounds in useful information.

Correspondence.

ANSWERS TO CORRESPONDENTS.

R.V.—We are not aware of any treatise on the subject.

Beta.—The numbers have been sent you by Parcels Post.

N.S.W.—The manufacture is not a difficult one by any means.

Chemical.—We are unable to procure you the information you desire.

X.X.—An advertisement.

Pupil.—It is a most difficult task and could not well be taught by correspondence.

Y.D.—Yes. Sal-soda.

Dubious.—The prices are given by firms doing the actual business, and are therefore reliable.

Union.—We have not heard of any such thing; it is possible, however, though not probable.

Merchant.—Thanks for the description of the process, and invitation to see it at work.

Analyst.—Your surmise is incorrect, it is added for quite another purpose.

D.J., R.D., and Caustic.—Suitable only for our advertising columns.

*** We do not hold ourselves responsible for the opinions expressed by our correspondents.*

DRUGGISTS AS ANALYSTS.

(To the Editor of the Chemical Trade Journal.)

Sir,—Are your correspondents not a little hard upon us druggists, as you choose to call us, or to be more correct, pharmaceutical chemists? Do not your readers know that to pass the examinations prescribed by the Board a very fair knowledge of analysis is required, and that our examinations are rigidly carried out—Can "Vigilant" say the same of the Institute of Chemistry? And if we have been taught the theory and practice of analytical methods, why should we not be allowed to make analyses for the public if the public prefers to come to us, instead of to a Fellow of the Institute of Chemistry?

"Vigilant" need not look down with such scorn upon his pharmaceutical brethren, as I venture to assert that in our body we have quite as large a percentage of competent men as the Institute of Chemistry has. Is it already forgotten (though scarcely two years have elapsed) that the Institute has admitted more than the moiety of its members *without examination?* Further comment is useless.

I am, yours etc.,

Pharmaceutical Chemist.

THE CHINA-CLAY UNION.

After more than usually prolonged pangs of parturition, says the *Financial News*, and at least one premature alarm, the China-Clay Union has at last been brought forth. It remains to be seen what amount of vitality there is in this precious product of ingenious promotion, and what sort of a reception it will meet with at the hands of the investing public. It seems to us, however, that the investing public will be like clay—even like china-clay—in the hands of the promoting potter if they are rash enough to take the £520,000. of shares which are now offered for subscription out of a total share and debenture capital of £1,300,000. So far as we can discover the position of the syndicate responsible for the company is not a whit better than when the enterprise was first announced, with a great flourish of trumpets, in April last, only, however, to be precipitately and immediately withdrawn directly afterwards. The big firms which stood aloof then are standing aloof now. According to the notice advertised three or four months ago, the vendors stipulated that one-third of the purchase-money was to be paid in cash and two-thirds in shares; and practically the same arrangement obtains in the new, or, more correctly speaking, the revived, scheme. The Union, which is ostensibly formed to consolidate the trade in china-clay in the counties of Cornwall and Devon, still comprises a number of very small and unprofitable concerns, and, unless we are very much mistaken, the total output which it will be able to control does not exceed 100,000 tons per annum out of a total, as estimated in the prospectus, of 450,000 tons.

The only sufficient ground for the establishment of such a Union, and the only condition that would tempt prudent people to put their money into it, would be its comprehensiveness. A "corner" in china-clay might be a profitable venture enough if the monopoly of the trade could be absolutely secured. But we look through the schedule of the Union in vain to find the names of some of the very largest producers in Cornwall. Where, for instance, are the Messrs. Martin, who own extensive works at St. Austell, Lee Moor, Treviscoe, Goonbarrow, and Virginia, besides other setts, and whose output is probably not less than 70,000 tons a year? Where again is the West of England China-clay Company, whose setts in one parish alone cover 6,000 acres; who have, in addition, large works at St. Austell, St. Mewan, St. Denis, and Roche, and who employ 600 hands out of the 2,000 or 3,000 engaged in the various clay works in the two counties? Their output, with that of another large firm which is standing outside the ring, amounts to about 150,000 tons a year, and this, added to Messrs. Martin's, gives a total of at least 220,000, or one-half of the entire production of the two counties. A good deal of space is devoted in the prospectus to Government returns showing the growth of the trade in china-clay and china-stone in Devon and Cornwall. No doubt there has been a considerable growth. The twelve years from 1876 to 1888 shew an increase from 139,775 tons to 412,000 tons; but when the directors of the company, taking this fact as a basis, go on to say that, "judging from the rate of progress for the last ten years, it is very probable that within the next ten years the annual production *from the properties of the Union* will be 1,000,000 tons per annum," they indulge in a purely fanciful calculation, the absurdity of which must be obvious to the most superficial observer. Supposing that the same remarkable ratio of increase were maintained—which is wildly improbable—it would only result in the production of 600,000 tons per annum from the properties of the Union, even if we allow that they are now producing 200,000 tons.

For the purpose of estimating dividend, however, the prospects of ten years hence are altogether too remote. The directors feel this, but they have nevertheless, made a sufficiently bold assumption. They say that the works acquired, have an estimated productive "capacity" of 300,000 tons per annum, and that an average of 8s. per ton profit can be made, giving an annual profit of £120,000. Do they really mean to assert that the forty-eight works which they have secured, many of which are insignificant and obscure, and some of which are barely remunerative, are turning out at the present time, or have ever turned out, 300,000 tons a year? If they are, then the total production of the two counties must be vastly in excess of the latest Government return; if they are not, then the estimate is deliberately misleading, and is only calculated to raise expectations in the minds of shareholders which are utterly impossible of fulfilment. The profit of 8s. per ton, too, is altogether extravagant. The cost of production is put down at 13s. 9d. a ton, and the average "selling quotation" at 21s. 9d.; but can the Union find a market at the prices they name? Can they guarantee an average of 21s. 9d. per ton for the whole of their clay, no matter whether it is 60,000, or 100,000, or 200,000 tons a year? How much best clay are they capable of turning out? What about the competition of the outside firms who have refused to be swept into the syndicate's net, and who represent over one-half of the entire trade of the two counties? Is that a matter to be ignored? It would be to their interest, of course, to supply the market on the most reasonable terms, whereas the Union having to struggle to pay dividends on an enormous capital, would have to command high prices. What would be the natural result of such a position? The promised 13 per cent. dividend on the Ordinary shares is based upon two highly problematical conditions—a minimum production of 200,000 tons a year, and an average profit of 8s. per ton. It is sheer nonsense. "Highly problematical" is altogether too favourable and considerate a term.

The purchase money and promotion charges are artfully lumped together, and they come to the respectable total of £1,220,000.—namely, £440,000. in cash, £500,000. in debentures, £20,000 in founders shares, and £260,000. in Preferential and Ordinary shares. The capital, including the debentures, is £1,300,000. of which the public are asked to subscribe for £520,000. in Preference and Ordinary shares. There is, therefore, a first charge of £25,000. to go to the vendors in the shape of interest on debentures. They get £440,000. in cash, and then have a lien on the properties to the tune of half a million more! In this connection it is important to observe that not a single valuation is given, nor are any particulars furnished of the amount of business done by the various firms acquired, or what is to be paid for them. We are informed, on what we believe to be good authority, that the sum to be paid in cash would in several cases more than cover the value of the properties brought into the "ring." Some of the smaller owners, it is said, have obtained for their setts prices greatly in excess of the real market value; and possibly this is one reason why the directors omit to give any details, but prefer to lump up costs of goodwill, stocks, law charges, registration fees, advertising costs, underwriting fees, brokerage, etc., etc., in one delightfully comprehensive total. The public will be more than usually rash if they put their money into an undertaking respecting which so little is known, and the future prospects of which are based on such miserably insufficient data. We have it on the authority of a local newspaper, that of the 48 properties enumerated in the schedule only one can be said to be producing best clay, that "some of the works are almost entirely unknown to the china-clay market, and the bulk of the others produce common clays, with just a few exceptions, where second

qualities are produced at, probably, a small profit." Yet for these inferior concerns, the aggregate output of which probably does not exceed 100,000 tons a year, the promoters have the conscience to ask no less than £1,220,000. A more audacious application has not been made to investors for a very long time, and if they are foolish enough to respond to it they will deserve the loss which must inevitably befall them.

DIRECTIONS FOR WORKING ALUMINUM.

THE following directions are given by the Scovill Mfg. Co., Waterbury, Conn. :

A cubic inch of pure aluminum weighs approximately one-tenth of a pound avoirdupois, being about one-fourth the weight of an equal bulk of pure silver.

Pure aluminum can be rolled, drawn, spun, stamped, engraved, burnished, polished, and soldered to the same extent and by the same processes as used on brass, with the following exceptions :

Annealing.—A very low and even temperature should be maintained in the muffle. Aluminum melts at about 1,300 deg. Fahrenheit—a very dark red. The inexperienced, therefore, cannot judge the proper annealing temperature by the eye alone, without danger of fusing the metal. When the metal has been heated enough to char the end of a pine stick, thus leaving a black mark in the wake of the stick as it is drawn across the metal, it is sufficiently annealed. The metal should then be withdrawn from the furnace and allowed to cool slowly in the air. For some work, such as stamping and drawing, it is sometimes better not to heat the metal so hot as to leave a dead black mark with the stick, but just enough to show a dark brown mark instead. Very thin sheets or wire can be annealed sufficiently for some purposes in boiling water.

Dipping and Pickling.—Remove the grease and dirt by dipping in benzine. To whiten aluminum, leaving on the surface a beautiful white matte, dip first in a strong, hot solution of potash, then rinse in water, and dip in undiluted nitric acid, 42 deg. Then wash in water, and dry as usual in hot sawdust.

Polishing.—Use fine white polishing composition or rouge, and a rag buff.

Burnishing.—Use a bloodstone or steel burnisher. For hand burnishing, use either kerosene oil or a solution composed of two tablespoonfuls of ground borax dissolved in about a quart of hot water, with a few drops of ammonia added.

For lathe work, the burnisher should wear upon the finger of his left hand a piece of Canton flannel, keeping it soaked with kerosene, and bringing it in contact with the metal, supplying a constant lubricant.

Very fine effects can be produced by first burnishing or polishing the metal, and then stamping it in polished dies, showing unpolished figures in relief.

Scratch Brushing.—Polish or burnish the surface, and then use a fine steel scratch brush.

Soldering.—A special solder is necessary. Cleanse the metal from grease and dirt. Use for soldering, fluid Venetian turpentine. Place the solder upon the metal with the Venetian turpentine, and heat gently in a blowpipe until the solder is melted. It will then be found to have fixed itself firmly to the aluminum.

Sand Castings.— Use open but very fine sand, and bake the mould. Large feeding gates should be provided, and the mould should be well vented. Pour the metal quickly, at a temperature but little above the melting point. Use either Taylor's or Dixon's plumbago crucibles.

Milling, Planing, and Turning.—Use plenty of oil to prevent the clogging of the tool, and to make it cut smooth.

Trade Notes.

PROFESSOR CARNELLEY.—The *Glasgow Herald*, noticing the death of Professor Carnelley, gives the following additional particulars of his career :—In November, 1882, he was elected to the Chair of Chemistry in University College, Dundee. In 1885 he published the first volume of " Physico-Chemical Constants," and the second in 1887. This work consists of two large quarto volumes, and took ten years' almost continuous labour to complete. He prepared for the press another large work on "Air and Ventilation," which treated of the heating and ventilation of houses and public buildings, and of the relation of ventilation to health and disease. Upwards of sixty original scientific papers were published by Professor Carnelley, most of them in the various science periodicals in Great Britain and Germany. He also contributed articles to several of the more popular periodicals, and largely to Messrs. Viewig and Sons' "German-English Dictionary of Scientific and Technical Terms." Professor Carnelley was elected to the Chair of Chemistry in Aberdeen University two years ago, in succession to Professor Brazier, and, although he only taught for two sessions, the influence and character of his work were becoming prominently apparent in this branch of study. For some time past he had been engaged in making investigations into the subject of school ventilation, and only a few days ago he informed one of his colleagues that he was working out some important details that he thought would prove of considerable value. To the University of Aberdeen his loss will be great, as he was regarded as one destined to take a first place in the profession.

THE SALT UNION.—The approximate deliveries of the Salt Union, Limited, during July last amount to 156,000 tons, against 135,000 tons last year.

A NEW YELLOW.—A new yellow colouring matter, made from toluylenediamine, oxalic acid, glycerine, and chloride of zinc, has been patented in France. It dyes wool and silk in acid baths a fine yellow with a green fluorescence, while cotton mordanted with tannin is dyed an intense yellow.

ROUND OAK IRON AND STEEL WORKS.—It is understood that the negotiations are now completed for the transfer of the Earl of Dudley's Round Oak Iron and Steel Works, Brierley Hill, to a new company, a prospectus of which is to be issued in a day or two. The new proprietary contemplate laying down plant for the manufacture of open-hearth steel upon a large scale—to the extent of some 1,500 tons per week.

A GIGANTIC COAL SYNDICATE.—A gigantic coal syndicate, representing not less than a production of 11,000,000 tons, has been formed in Germany. Its principal object is to check the rise in wages, which employers state have increased 50 per cent. The movement is said to be supported by Prince Bismarck, and is, of course, directly hostile to the German Emperor. There are signs that a severe industrial struggle is about to take place.—*Liverpool Journal of Commerce*, July 20

TO RENDER IVORY FLEXIBLE.—Ivory is readily rendered quite flexible, says the *Pharmaceutical Era*, by immersion in a solution of pure phosphoric acid (specific gravity 1·13) until it loses, or partially loses, its opacity, when it is washed in clean cold water and dried. In this state it is as flexible as leather, but gradually hardens by exposure to dry air. Immersion in hot water, however, restores its softness and pliancy. The following method may also be employed :—Put the ivory to soak in 3 ounces nitric acid, mixed with 15 ounces of water. In three or four days the ivory will be soft.

TEESSIDE SALT INDUSTRY.—A limited company is being promoted to develop and work part of the salt royalty owned by Messrs. Watson and Scrafton at Haverton Hill. Salt has been proved on the adjacent land at depths varying from 850 to 1,000 feet, the bed, which runs to a thickness of about 100 feet, lying nearer the surface there than at any other place where it has been proved. It is expected that the style of the new firm will be the Tees Salt Company. The Middlesborough owners have now nearly completed their third borehole near the North Ormesby tollbar, and their salt pans at Cargo Fleet are rapidly approaching completion.

A LARGE PETROLEUM TANK.—The British Consul at Leghorn reports that a reservoir for the storage of petroleum, capable of containing about 3,000 tons of oil, has been constructed at that port. It has been made at the cost, and is the property, of the firm of Nobel, of St. Petersburg, to whom the municipality gave the ground free. The reservoir was just filled in April last, and from that month to the end of the year three "bateaux citernes," or ships fitted to carry oil in bulk, arrived there from Batoum, and each discharged from 1,000 to 1,500 tons of oil into the new reservoir. The same firm has set up workshops alongside the reservoir for the making of tin cases and wood boxes, in which the oil is now dispatched by rail to the inland centres.

THE PHOSPHATE LANDS OF CANADA.—A telegram from Ottawa says it is reported that the owners of the phosphate lands in the vicinity have not yet been able to complete the sale of the property to the great Five Million Dollar Phosphate Trust, which was organised some time ago in London for the purpose of acquiring the principal phosphate lands in the Southern States of Eastern Canada and other places. It is understood that a large part of the best phosphate territory in Eastern Canada was bonded to the trust, which is headed by the Dukes of Westminster, Richmond, Portland, Sutherland, Fife, and others. An enormous impetus has been given to the value of the Canadian phosphate lands, which are now held at fabulous prices.

MANGANESE ORES.—An American contemporary, the *Oil, Paint, and Drug Reporter*, publishes an enquiry from J. and H., Hamburg, from which we quote. "We are doing a large business in manganese ores, and therefore are interested in the development of the manganese mines situated on the river Mackenzie, *British* North America. We should like to get some information about the test of this ore, the quantities likely to be exported, *and whether this mineral has already been sold in Europe.*" The italics are ours. Perhaps some of our readers would like to *give* the information; or better, to obtain it for themselves.

Market Reports.

REPORT ON MANURE MATERIAL.

There has been less business doing both in phosphatic and nitrogenous material during the past week, owing to the advanced prices demanded by sellers, and to the indisposition of buyers to follow the advance.

Quotations for mineral phosphates are very firm, and although prices last quoted would still be business, the tendency is decidedly in an upward direction.

There are several River Plate cargoes of bones on the market, for which sellers require £5. 12s. 6d., delivered good U.K. ports, but so far this price has not been paid, and we do not hear of any business within the past week. Prices demanded for East India crushed bones have also precluded business, there being nothing to report since the sale at £5. 7s. 6d., £5. 10s. or perhaps £5. 12s. 6d. may now be considered nearest value, though sellers ask considerably more money than this. Nothing further is reported in East Indian bone meal, £5. 17s. 6d. being required for September-October shipment, and £5. 15s. having been refused. Spot value is £5. 15s. Further parcels of good grinding bones have been sold in Liverpool at up to £5. 5s. per ton in bulk, ex-quay.

Several cargoes of nitrate of soda have changed hands at 8s. 4½d. for ordinary quality, at port of call or due, and this may be considered nearest closing value; 8s. 9d. would have to be paid for September-October or October-November shipment. Spot price is firm at 8s. 4½d. for ordinary quality and 8s. 6d. for refined.

There is still business doing in home prepared dried blood, but we do not hear of anything passing in River Plate production. Value of home prepared may be quoted as 10s. 3d. to 10s. 6d. free to rails, according to position of works. For ground hoof nearest value is about 9s. Manufacturers of supers being busy fulfilling contracts already in hand, do not seem disposed to quote for any near delivery, but value in bulk, f.o.r. at works, may be quoted as about 50s. per ton.

TAR AND AMMONIA PRODUCTS.

The benzol market has been increasing in firmness, and a fair business has been done at advanced prices, viz., 4s. 3d. for 90s., and 3s. 3d. for 50/90s., for delivery up to June in next year, and now higher prices are asked. There is a good demand for solvent naphtha at old rates, and creosote is maintaining its position very well. Anthracene is firmer than at this time last week, further, rather extensive transactions have taken place for prompt and forward delivery at 1s. 1d. for 30% B, and up to 1s. 4½d. for 30% A, at which prices there are further buyers. The pitch market still remains quiet, but prices have maintained themselves fairly well.

The sulphate of ammonia market continues very firm, and there are numerous buyers in all positions. Prompt quotations are now £11. 15s., Hull and Liverpool, with £11. 12s. 6d. at Leith, and it is rumoured that forward contracts have been concluded upon the basis of these prices up to the end of the year, and even into the spring. A further advance is therefore not unlikely, although we are on the eve of a heavier production. Leith values may be stated at £11. 12s. 6d., and Beckton, £11. 15s., while outside London makes average from £11. 13s. 9d. to £11. 15s.

MISCELLANEOUS CHEMICAL MARKET.

The demand for alkalies continues brisk, and prices for caustic soda during the week have further advanced. Prices for 70% f.o.b. is now £10. 10s. to £10. 12s. 6d. per ton; and for 60% £9. 15s. Cream 60% in limited quantities is rather irregular at £8. 17s. 6d. to £9. 5s. per ton. Soda ash remains steady at 1¼d. per deg. for strengths from 48% to 52%. For high test ash, 57/58%, prices are slightly lower at 1 5/16d. to 1 3/16d. per deg. The quotations for forward deliveries remain firm, as previously reported, and a fair amount of business has been done in bleaching powder for 1891 delivery. On the spot, bleaching powder is quoted £5. 10s. per ton at works, and £5. 15s. f.o.b. Liverpool with brisk demand. Chlorate of potash firm at 5d. per lb. Chlorate of soda advanced to 6½ per lb. Muriatic acid and vitriol quiet, and prices unchanged. Sulphur in fair request at £4. 2s. 6d. per ton, in bulk, though some transactions are reported slightly under this figure. Sulphate of copper rather firmer owing to rise in the metal, and there is more enquiry for forward deliveries; but makers are holding firmly for advances on present rates. Potash, caustic, and carbonate continue scarce for early deliveries and prices are higher. Acetates of lime are without quotable change, but the tendency appears to be rather towards higher prices. Other acetates remain quiet. Acetic acids unchanged in price. Prussiate of potash scarce. Muriate of ammonia is in rather better demand at £23. per ton. Carbolic acids still slow to move, and prices for crude and crystal remain as quoted for some weeks past.

THE TYNE CHEMICAL REPORT.

TUESDAY.

With the exception of bleaching powder, the chemical market here has continued very firm; caustic soda especially being in good demand, and price has been advanced 10s. per ton since last report. Soda ash and soda crystals are much about the same as last week. Sulphate of soda is in better demand at previous quotations. Bleaching powder has had a further relapse in price, but market closes firmer to-day with upward tendency.

Quotations for prompt delivery are:—Bleaching powder, in softwood casks, £5. 2s. 6d. per ton; hardwood casks, 5s. per ton extra; caustic soda, 77%, £11. per ton; ground and packed in 3-4 cwt. barrels, £14. per ton; soda ash, 48/52%, 1 3/16d. per degree less 5% to 6%; soda crystals, 55s. 6d. to 56s. per ton; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 41s. per ton; recovered sulphur, rock, in bags, £4. 3s. 6d. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

Small coals for manufacturing purposes are easier in prices, and sellers are now offering Durham and Northumberland small at prices ranging from 6s. 9d. to 7s. 6d. per ton, according to quality.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The "Syndicate" continues the subject of frequent, contradictory, and invariably very vague reports, and there are still many unbelievers concerning the ultimate event. It is said that a large firm in Glasgow make it a *sine qua non* that they shall be chosen to represent the Union in Scotland and administer the whole of its property there; an arrangement which other firms are naturally inclined to regard with no little sourness. Meanwhile the market generally maintains its firmness, and except in the case of soda ash and sulphate of copper, prices are either higher or at least well held. There has been an additional mount of 5s. in the middle gravities of caustic, and saltcake also has slightly advanced. At the close of the week, sulphate of ammonia in double bags, for Glasgow shipment prompt, fetched £11. 16s. 3d., which to-day also may be taken as the value; while the f.o.b. Leith figure has correspondingly advanced to £11. 10s.—£11. 12s. 6d. Burning oil fixtures for winter delivery have been completed up to the extreme output capacity of one or two of the companies, the others following at a more leisurely but still satisfactory pace, and the rest of the paraffins are rather strong as heretofore. Chief prices current are:—Soda crystals, 56s. net Tyne; alum in lump £5. net Glasgow; soda ash, 1 3/16d. less 7%, Tyne; caustic soda, white, 76°, £12., 70/72°, £10. 5s., 60/62°, £9. 5s. and cream, 60/62°, £8. 10s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s., and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1 3/16d., less 2½% Tyne; saltcake, 32s. 6d.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 5s. to £5. 10s., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 7½ and 10% to Scotch and English buyers respectively, delivered (export orders, a farthing less, and 5% off f.o.b. Glasgow); chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 4½d. to 8s. 7½d.; sulphate of ammonia £11. 16s. 3d. f.o.b., Glasgow, in double bags; £11. 10s. to £11. 12s. 6d. f.o.b. Leith, salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £17. 15s., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3½d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less). ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 18,579 bags.

THE LIVERPOOL MINERAL MARKET.

Our market has not only maintained its firmness this week, but in some cases has advanced. Manganese: Arrivals somewhat increased, and prices remain unaltered. Magnesite: On account of very heavy stocks prices are totally in the hands of buyers; raw ground, £6. 10s., and calcined ground, £11. Bauxite (Irish Hill brand): The demand continues strongly to increase, and prices are very firm; Lump, 20s.; seconds, 16s.; thirds, 12s.; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk: Arrivals have been rather smaller; but on account of increased demand prices have risen considerably, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes (carbonate): The production has increased, prices, therefore, somewhat easier; selected crystal lump scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; selected crystal ground, £8. Sulphate: The production of best white has decreased, making prices firmer; best lump, 35s. 6d.; good medium, 30s.; medium, 25s. 6d. to 27s. 6d.; common, 18s. 6d. to 20s.; ground best white, G.G.B. brand, 65s.; common, 45s.; grey, 32s. 6d. to 40s. Pumicestone steady; ground at £10., and specially selected lump, finest quality, £13. Iron ore easier. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore without alteration. Spanish manganiferous ore in demand. Emerystone: Best brands asked for at full figures. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal in fair request, without any alteration in prices. Chrome metal, 5s. 6d. per lb. Chrome ore: Prices rather stronger. Antimony ore and metal in strong demand at high prices. Asbestos is in strong demand, especially rock, and prices very firm. Potter's lead ore of best and standard brands in request; powdered, £15. 10s.; smalls, £14. to £15.; selected lump, £16. to £17. Calamine: Best qualities scarce, 60s. to 80s. Strontia steady; sulphate (celestine), 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand, and brings full prices; 50s. for ground English. Felspar, 40s. to 50s.; fluorspar, 20s. to £6. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton; founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel steadier. Chrome iron unaltered at last quotations. Ground mica, £50. China clay: In view of the combination, prices are somewhat firmer—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), finest quality, 20s. to 22s.

THE LIVERPOOL COLOUR MARKET.

Colours steady. Ochres: Oxfordshire has been quoted at £10. £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc, V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

New Companies.

F. F. Somerset and Co.—This company was registered on the 15th inst., as an unlimited company, with a capital stock of £67,000., to carry on business as brewers, maltsters, wine and spirit merchants, etc. The first subscribers are:—

	Stock.
Francis Flower Somerset, Newbury, Berks	£66,700
Mrs. Somerset, Newbury, Berks	50
Henry Somerset, Newbury, Berks	50
R. Birch, Newbury, Berks	50
Miss Emmeline Somerset, Newbury, Berks	50
Miss Elizabeth Somerset, Newbury, Berks	50
Miss M. Somerset, Newbury, Berks	50

G. T. Cuming and Son, Limited.—This company was registered on the 16th inst., with a capital of £10,000., in £1. shares, to acquire the business of G. T. Cuming and Son, of Kensham Mills, Bradninch, Devon, paper manufacturers. The subscribers are:—

	Shares.
E. B. Cuming, Bradninch, Devon, paper manufacturer	1
E. Gordon Cuming, Onterard, Galway, District Inspector R.I. Constabulary	1
Miss E. M. Cuming, Bradninch	1
Miss A. R. Cuming, Bradninch	1
John Pope, junr., Exeter, solicitor	1
S. P. Pope, Exeter, solicitor	1
W. H. Stone, Exeter, accountant	1

George J. Hues and Co., Limited.—This company was registeren on the 16th inst., with a capital of £8,000., in £10. shares, to acquire certain premises at Widnes, for carrying on business of manufacturers of metals, metallic salts, and other chemical substances. The subscribers are:—

	Shares.
G. J. Hues, 14, Fern-grove, Liverpool, chemical manufacturer	150
A. G. Philips, C.E., 18, Fopstone-road, Kensington	100
Mrs. M. A. Philips, 18, Fopstone-road, Kensington	50
Miss E. Philips, 18, Fopstone.road, Kensington	50
J. W. Drew, 18, Fopstone-road, Kensington, electrical engineer	10
E. W. Voelker, 11, Salisbury-square, E.C., analytical chemist	20
T. R. McPhail, City-buildings, Liverpool, chemical broker	20

Thomas Hubbuck and Son, Limited.—This company was registered on the 18th inst., with a capital of £200,000., in £10., shares, to acquire the business of oil and colour merchants and manufacturers, carried on by the firm of Thomas Hubbuck and Son, at 24, Lime-street, and at Hubbuck's Wharf, Ratcliff. The subscribers are:—

	Shares.
A. G. Hubbuck, Elmstead-lodge, Chislehurst, oil and colour merchant	1
E. F. Hubbuck, 24, Lime-street, oil and colour merchant	1
C. A. Hubbuck, 24, Lime-street, oil and colour merchant	1
Wm. Higgs, 82, St. Paul's-road, Bow, clerk	1
G. F. West, 19, Pembroke-square, W., private secretary	1
T. Stokes, 360, Stanstead-road, Catford, commercial traveller	1
J. Ford, 23, College-hill, chartered accountant	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

W. White, J. Cooke, and S. A. Welch, under the style of White, Cooke, & Co., Newcastle-on-Tyne, brick mannfacturers.

Leadbetter and Pegg, High Wycombe and Uxbridge, brewers, maltsters and aerated water manufacturers.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Rendering Fabrics Rot-proof. J. Williams. 12,513. August 11.
Reducing Valves. C. Stuart. 12,523. August 11.
Softening Water.—(Complete Specification). C. E. Gittins. 12,533. August 11.
Drying, Calcining, and Evaporating Substances. E. Barlow and R. Cunliffe. 12,535. August 11.
An Improved Insecticide. E. Edwards. 12,546. August 11.
Manufacture of New Diphenyl Derivatives. J. Y. Johnson. 12,550. August 11.
Separating Tin from other Metals.—(Complete Specification). J. A. F. Bang and M. C. A. Ruffin. 12,553. August 11.
Composition for Treating Sheep for Foot-rot.—(Complete Specification). A. Learner. 12,555. August 11.
Controlling the Flow of Liquids. H. W. Teed. 12,565. August 11.
Drawing Coke from Coke Ovens. C. W. Bartholomew and J. Oxley. 12,580. August 12.
Blood Serum for Polishing Leather. T. B. Wood and J. M. Pillans. 12,600. August 12.
Manufacture of Artificial Stone. C. George. 12,607. August 12.
Coating Metals with Lead. A. M. Clark. 12,624. August 12.
Manufacture of Nickel. L. Mond. 12,626. August 12.
Improvements in Nickel Plating.—(Complete Specification). L. Mond 12,627. August 12.
Welding Metals by Electricity.—(Complete Specification). H. E. Fowler. 12,628. August 12.
Sugar Refining.—(Complete Specification). H. H. Lake. 12,635. August 12.
Compressed Fuel. G. Frank. 12,638. August 12.
Manufacture of Artificial Fuel. R. Schimper. 12,639. August 12.
Generating Chlorine Gas.—(Complete Specification).—C. T. J. Vautin. 12,641. August 12.
Appliances for Fumigating Plants. J. S. McDougall and J. T. McDougall. 12,645. August 12.
Apparatus for the Manufacture of Sulphate of Ammonia. R. Dempster. and J. Dempster. 12,661. August 13.
Annealing Tin and Terne Plates. W. Brazell. 12,666. August 13.
Treatment of Slags containing Phosphate of Lime. J. Simpson. 12,670. August 13.
Manufacture of Soap Tablets. F. W. Kitto, C. W. Kitto, and G. Herschell. 12,673. August 13.
New Process for Bleaching Vegetable Fibres.—(Complete Specification). K. Trobach and G. J. Bruck. 12,689. August 13.
New Derivatives of Alizarine. B. Willcox. 12,715. August 13.
Utilization of Gases which form Insoluble Precipitates. H. B. Yardley. 12,717. August 14.
An Improved Brick. J. T. Fryer. 12,721. August 14.
Drying Insoluble Substances such as Portland Cement. J. Bowing. 12,738. August 14.

Improvements in Tanning. J. B. Scammell and P. W. Ellis. 12,751. Aug. 14.
Motors adapted to be operated by Explosives. J. H. V. Stallaert. 12,760. August 14.
Preserving Alkaline Sulphide and similar Liquors. J. Anderson. 12,782. August 14.
A New Explosive. A. L. Brociner. 12,785. Aug. 15.
Manufacture of Blocks of India-rubber. C. Macintosh & Co., Ltd., and J. Bagnall. 12,786. Aug. 15.
Manufacture of India-rubber Thread. C. Macintosh & Co., Ltd. and J. Bagnall. 12,787. Aug. 15.
New Products from the Treatment of Grain. J. A. Fawcett. 12,793. Aug. 15.
A New Insecticide. F. King. 12,804. Aug. 15.
Secondary Batteries.—(Complete specification). H. H. Lake. 12,830. Aug. 15.
An Electrical Watt Meter. E. Wilson. 12,832. Aug. 15.
Malt Wine. F. Sauer. 12,834. Aug. 15.
Apparatus for Separating Precious Metals from Ores. R. E. Shell. 12,836. Aug. 15.
Improved Method for Burning Liquid Hydro-carbons.—(Complete specification). P. Humbert. 12,843. Aug. 15.
Improvements in Atmospheric Gas Burners. S. Switzer. 12,851. Aug. 16.
Automatically Supplying Oils to Self-generating Gas Burners. W. G. Robinson and F. Plumb. 12,859 Aug. 16.
Improvements in the Manufacture of Gas.—(Complete specification). J. T. Key. 12,860. Aug. 16.
Gas or Combustile Vapour Engines. A. E. Robinson and H. Robinson. 12,861 Aug. 16.
Improvements in the Manufacture of Soap. E. J. T. Digby. 12,864 Aug. 16.
Apparatus for Inhaling Bromic Ethyl. J. Levy and J. Schreiner. 12,878. Aug. 16.
Spray Producers. G. A. Nussbaum. 12,882. Aug. 16.
An Insecticide and Method of Making the Same. J. P. Bayly. 12,892. Aug. 16.
Improvement in the Manufacture of Cement. W. R. Taylor. 12,894. Aug. 16.
Improvements in Producing Oil Water Gas. A. M. Hay. 12,895. Aug. 16.
Refrigerating Apparatus. H. Imray. 12,896. Aug. 16.
Improved Kiln for Drying Moist Materials. G. A. Hart. 12,897. Aug 16
Improved Construction of Gas Stove. A. Younie. 12,903. Aug. 16.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Aug. 16th.

Alkali—
Holland, 94 c. T. H. Lee

Antimony Ore—
Pt. Douglas, 28 t. W. Balchin
Sydney, 10 Bank of N. S. Wales
" 14 "
Germany, 4 c. H. R. Merton & Co.
A. Turkey, 20 t. H. R. Merton & Co.
N. Zealand, 15 N. Z. Antimony Co.
Portugal, 50 H. Emanuel

Acetic Acid—
Holland, 50 pks. Beresford & Co.

Acetate of Lime—
U. S. 282 pks. Lister & Biggs

Barium Chloride—
Germany, £80 Petri Bros.

Barytes—
Holland, 72 cks. W. Balchin
" 57 Magee, Taylor, & Co.
" 22 W. Harrison & Co.
" 4 J. L. Lyon & Co.
" 90 A. Boltz
Germany, 45 O'Hara & Hoar

Bones—
U. S. 15 t. H. A. Lane & Co.
Rockhampton, 5 t. Anning & Cobb
Brisbane, 4 N. Z. L. & M. A. Co. Ltd.
Townsville, 2 Goad, Rigg, & Co.
Teneriffe, 3 Dyster, Nalder, & Co.
Melbourne, 25 Anning & Cobb
Sydney, 16 Goad, Rigg, & Co.
Adelaide, 1 G. & R. Wills & Co.

Bone Meal—
E. Indies, 300 t. Gonne, Croft, & Co.

Bromine—
Germany, £45 A. & M. Zimmermann

Brimstone—
Italy, 49 t. W. Croft
" 225 W. C. Bacon & Co.
" 50 Soundy & Son

Boracic Acid—
Italy, 40 pks. W. Nicolson & Co.
" 40 "

Borax—
Germany, £80 A. & M. Zimmermann

Caoutchouc—
Batavia, 15 c. Wrightson & Son
Rosario, 29 Kebbel, Son, & Co.
France, 20 Flageollet & Co.
E. Indies, 33 W. Pope & Co.
Quilimane, 19 Hale & Son
Inhambane, 320 L. & I. D. Jt. Co.
" 17 W. M. Smith & Sons
Chiloane, 14 Elkan & Co.
E. Indies, 10 Petrocochino Bros.
Mozambique, 18 L. & I. D. Jt. Co.

Carbolic Acid—
France, 80 pks. W. G. Blagden

Copper Ore—
Germany, 10 c. Schenker & Co.
Pt. Douglas, 28 Major & Field
Belgium, 5 t. Andorson, Becker, & Co.
Sydney, 5 L. & N. W. Rly. Co.

Cream of Tartar—
France, 5 pks. W. V. Robinson & Co.
Spain, 5 B. & F. Wf. Co. Ltd.
Italy, 20 "
Holland, 6 Middleton & Co.
Spain, 6 F. Smith
France, 3 E. W. Carling & Co.
Spain, 5 B. & F. Wf. Co. Ltd.
Italy, 20 Howards & Son

Chemicals *(otherwise undescribed)*
Germany, £54 T. H. Lee
" 42 Phillips & Graves
Holland, 15 "
Germany, 14 T. H. Lee
France, 31 Hemingway & Co.
Germany, 45 C. Smith
" 676 A. & M. Zimmermann
" 9 N. Steinberg

Dyestuffs—
Extracts
U. S 50 pks. W. Burton & Sons
Holland, 1 pkg. J. Sinclair & Sons
Halifax, 600 A. J. Humphrey
" 25 pks. T. Ronaldson & Co.
France, 85 L. J. Levinstein & Sons
Saffron
Spain, 1 pkg. Major & Field
" 1 C. Brumlen
Myrabolams
E. Indies, 150 pks. L. & I. D. Jt. Co.
Indigo
E. Indies, 1 cht. Cayzer, Irvine & Co.
Germany, 1 cs. T. H. Lee
E. Indies, 10 chts. J. Owen
" 20 Elkan & Co.
" 2 Parsons & Keith
" 2 L. & I. D. Jt. Co.
" 5 Ripley, Roberts & Co.
" 130 Ernshausen & Co.
Cochineal
Germany, 5 pks. W. M. Smith & Sons
Tanners' Bark
Holland, 25 t. Vande Velde
" 10 Sawyer, Mead & Co.
Melbourne, 38 Leach & Co.
Adelaide, 26 Devitt & Hett
" 150 Baxter & Hoare
Belgium, 15 Leach & Co.
Melbourne, 303 Baxter & Hoare
E. Indies, 22 Beresford & Co.
Melbourne, 327 Elkan & Co.
" 73 Beresford & Co.
Hobart, 26 A. & W. Nesbitt
Durban, 20 "
Natal, 23 Hicks, Nash & Co.
Anthracene
Belgium, 46 pks. British Alizarine Co.
Cutch
E. Indies, 1,000 pks. Hoare, Wilson & Co.
Sumac
Italy, 55 pks. Page, Son & Co.
Argols
Italy, 92 pks. Thames S. Tug Co.
Gambier
Singapore, 92 pks. Lewis & Peat
" 402 Adamson, Gilfillan & Co.
" 92 L. & I. D. Jt. Co.
Alizarine
Holland, 10 pks. T. H. Lee
" 18 P. & O. Co.
Divi Divi
E. Indies, 10 pks. Beresford & Co.
Orchella
Madeira, 18 pks. Price, Hickman & Co.

Dyestuffs *(otherwise undescribed)*
Germany, 25 pks. Forbes, Abbott & Co.
France, 1 Hernu, Peron & Co.

Glycerine—
Holland, 14 pks. F. W. Heilgers
Germany, £60 Beresford & Co.

Guano—
Holland, 100 t. Anglo-Contl. Guano Wks.

Glucose—
Germany, 200 pks. Union Lighterage Co., Ld.
Holland, 16 pks. 160 cwts. J. Parlevliet
U. S., 20 111 L. Sutro & Co.
" 30 180 Botolph & Nich's Wvs. Co., Ld.
" 100 554 L. Sutro & Co.
" 50 300 Props. Scott's Wf.
" 500 500 Union Lighterage Co., Ld.
" 30 165 M. D. Co.
" 250 1,480 Union Lighterage
Germany, 100 100 Botolp & Nich's Wvs. Co., Ld.
" 994 980 R. E. Drummond
U. S., 150 856 C. Czarnikow
" 1,625 2,234 Union Lighterag
Germany, 24 240 Dutrulle, Solomon & Co.

Gutta Percha—
Hong Kong, 34 c. Lewis & Peat

Isinglass—
E. Indies, 14 pks. Rehder & Co.
Demerara, 1 H. M. Smith & Sons
E. Indies, 3 Hale & Son
" 1 Forbes, Forbes & Co.
" 36 L. & I. D. Jt. Co.
Singapore, 3 Cox, Patterson & Co.
E. Indies, 14 Clarke & Smith

Manure—
Holland, 50 t. Lawes Manure Co., Ld.
" 25 Anglo-Contl. G. Wks.
France, 95 "

Naphtha—
Holland, 1 drm. Stein Bros.

Nitroxylol—
Belgium, £25 H. Birdseye & Co.

Nitre—
Peru, 9,333 bgs. W. Montgomery & Co.

Pearl Ashes—
France, 475 c. Petri Bros.
" 200 F. W. Berk & Co.

Potassium Permanganate—
Germany, 11 pks. Vogt & Co.

Potassium Carbonate—
Germany, 19 pks. Beresford & Co.

Paraffin Wax—
United States, 145 brls. Rose, Wilson & Co.
" 70 G. H. Frank
" 2,000 J. H. Usmar & Co.
" 70 cs. H. Hill & Sons
" 75 brls. Morrlaunt Bros.
" 213 H. Hill & Sons

Plumbago—
Germany, 89 cks. Brown & Elmslie
E. Indies, 24 cks. Prop. Chmblns. Wf.
" 208 J. Thredder & Co.

Potashes—
Montreal, 78 c. Charles & Fox

Potassium Muriate—
Germany, 508 pks. Ang. Cont. G. Wks.

Potassium Sulphate—
Germany, 508 pks. Ang. Cont. G. Wks.

Saltpetre—
Germany, 76 cks. J. Hall & Son
" 24 cks. P. Hecker & Co.

Sodium Acetate—
France, 18 pks. Barr, Moering & Co.

Stearine—
Belgium, 101 bgs. H. Hill & Sons
Germany, 100 W. Balchin
Rabat, 17 cs. A. W. Nesbitt
Belgium, 125 bgs. H. Hill & Sons
United States, 250 cks. Union Lighterage Co., Ltd.
Sydney, 4 cs. Flack, Chandler & Co.
Holland, 17 pks. Perkins & Homer

Tartaric Acid—
Holland, 7 pks. Middleton & Co.
" 5 B. & Wf. Co.
" 20 W. C. Bacon & Co.

Tar—
N. Russia, 1,885 brls. Linck, Moeller & Co.

Ultramarine—
Germany, 14 cs. G. Steinhoff
" 55 pks. G. Steinhoff

Zinc Oxide—
Holland, 25 cks. G. Dards
" 75 brls. M. Ashby, Ld.

LIVERPOOL.

Week ending August 19th.

Antimony Ore—
St. Johns, Nfld. 52 brls

Albumen—
Ghent, 10 cs. J T. Fletcher & Co.

Borate of Lime—
Valparaiso, 1,290 sks.

Barytes—
Rotterdam, 11 cks.
Antwerp, 1

Boracic Acid—
Leghorn, 57 cks.

Bones—
Cadiz, 440 bgs. Strumpel & M. S. Brown
New York, 364
Pernambuco, 35 t.

Copper Ore—
Montreal, 60 bgs.
Rosario, 1801

Caoutchouc—
Pernambuco, 13 brls.
" 2 Fry Miers & Co.
" 19

Charcoal—
Antwerp, 80 bgs.
Chemicals *(otherwise undescribed)*
Rotterdam, 16 cks.
Dyestuffs—
Myrabolams
Bombay, 231 bgs. D. Sassoon & Co.
" 495 Forbes Forbes & Co.
" 321 Beyts Craig & Co.
" 360
Sumac
Palermo, 100 bgs.
" 100 J. Kitchen, Ld.
" 50
Fustic
Pernambuco, 1 t.
Logwood
Laguna de Terminos, 650 quinbals Seilzen Bros.
Belize, 247 t. Thompson M'Kay & Co.
Cutch
Genoa, 40 cs.
Extracts
Antwerp, 5 cks. J. T. Fletcher & Co.
" 15
Dirt divi
Hamburg, 27 bgs.
Bremerhaven, 2 dms.
Glycerine—
Rotterdam, 5 cs.
Glucose—
Hamburg, 22 cks.
Horn Piths—
Pernambuco, 6 t.
Manure—
Phosphate Rock
Antwerp, 435 t.
Naphtha—
New York, 1,000 brls.
" 4,000
Nitrate—
Iquique, 15,433 bgs.
Oxalic Acid—
Rotterdam, 5 cks.
Phosphate—
Antwerp, 3,000 bgs.
Pyrites—
Huelva, 1,636 t. Matheson & Co.
" 1,590 "
" 1,110 "
" 1,448 "
" 1,571 "
" 1,654 "
Saltpetre—
Hamburg, 50 cks.
Sulphur—
Palermo, 100 bgs.
Sulphur Ore—
Huelva, 1,129 t. Matheson & Co.
Tartaric Acid—
Rotterdam, 21 cks.
Tartar—
Bordeaux, 5 cks.
Tarragona, 5 Sachse & Klemm
Naples, 1
Bari, 4
Ultramarine—
Rotterdam, 3 cks.
Waste Salt—
Hamburg, 140 t.
" 240
Zinc Oxide—
Antwerp, 65 brls. J. T. Fletcher & Co.
" 25 "
St. Nazaire, 10 cks.
Antwerp, 45 brls.
Zinc Ashes—
Marseilles, 23 cks.

GLASGOW.

Week ending August 21st.

Alumina Sulphate—
Rotterdam, 41 cks. J. Rankine & Son
Alum—
Hamburg, 152 brls.
Barytes—
Rotterdam, 69 cks.
Cream of Tartar—
Marseilles, 4 brls.
Copper Ore—
Huelva, 1,720 t.
Caustic Potash—
Dunkirk, 21 drums.
Chrome Ore—
Hamburg, 1,306 bgs.
Caoutchouc—
Rotterdam, 2 cs. J. Rankine & Son
Dyestuffs—
Logwood
Jamaica, 518 t. McArthur Scott & Co.
Extracts
Antwerp, 1 cs. 2 cks.
Alizarine
Rotterdam, 44 cks.
Rotterdam, 65 cks. J. Rankine & Son
Glycerine—
Marseilles, 25 brls.
Hamburg, 20 drums.
Glucose—
Rotterdam, 10 bgs. J. Rankine & Son
Gutta Percha—
Amsterdam, 72 bls.
Manure—
Phosphate Rock
Aruba, 351 t. A. Cros & Sons
Pyrites—
Huelva, 1,668 t. Tharsis & Co.
Sulphur—
Marseilles, 50 brls. 5 cs.
Sodium Bichromate—
Rotterdam, 1 ck. J. Rankine & Son
Saltpetre—
Hamburg, 100 kgs. J. Poynter & Co.
Tartaric Acid—
Marseilles, 4 cks.
Ultramarine—
Rotterdam, 10 cs. J. Rankine & Son
Antwerp, 10 cs.
Waste Salt—
Hamburg, 150 t.
" 122
" 1,000 bgs.

HULL.

Week ending August 21st.

Alumine Sulphate—
Rotterdam, 41 cks. W. & C. L. Ringrose
Acetate of Lime—
St. Malmo, 178 sks. Hutchinson & Son
Barytes—
Antwerp, 22 cks. H. F. Pudsey
Bremen, 20 Cammell, Woolf & Haigh
" 23 Tudor & Sons
" 62
Cream of Tartar—
Rotterdam, 4 cks. G. Lawson & Sons
Chemicals *(otherwise undescribed)*
Hamburg, 212 pks. Wilson Sons & Co.
Dunkirk, 67 "
Antwerp, 83 "
Dunkirk, 44 "
Rotterdam, 3 kgs W. & C. L. Ringrose
Genoa, 10 cks. Wilson Sons & Co.
Dyestuffs—
Valonia
Smyrna, 300 t.
Madders
Rotterdam, 2 cks. Hutchinson & Son
Marseilles, 2
Indigo
Amsterdam, 7 chts. W. & C. L. Ringrose
Alizarine
Rotterdam, 26 cks. W. & C. L. Ringrose
" 16 pks. Hutchinson & Son
" 3 cks. W. & C. L. Ringrose
" 41 Hutchinson & Son
Ferro Manganese—
Rotterdam, 28 cks. Furley & Co.
Graphite—
Hamburg, 170 cks.
Glucose—
Hamburg, 22 cks. Bailey & Leetham
" 40
Stettin, 600 bgs. C. M. Lofthouse & Co.
" 200 32 cks.
Manure—
Phosphate Rock
Coosaw, 1,700 t.
Manganese Ore—
Rotterdam, 1 ck. G. Lawson & Sons
Pitch—
Dunkirk, 42 cks. Wilson Sons & Co.
Phosphate—
Ghent, 100 t.
Sulphate—
Antwerp, 44 cks. H. F. Pudsey
Saltpetre—
Hamburg, 5 kgs. C. M. Lofthouse & Co.
Tar—
Libau, 65 brls.
Turpentine—
Libau, 48 brls.
Ultramarine—
Rotterdam, 2 cks. Hanger, Watson & Harris
" 4

GRIMSBY.

Week ending August 16th.

Albumen—
Dieppe, 70 cs.
Chemicals *(otherwise undescribed)*
Hamburg, 5 pks.
Rotterdam, 9
Dyestuffs *(otherwise undescribed)*
Antwerp, 6 pks.
Glucose—
Hamburg, 30 pks.
Zinc Ashes—
Antwerp, 16 pks.

GOOLE.

Week ending August 13th.

Alum—
Rotterdam, 14 cks.
Antimony—
Boulogne, 6 cks.
Caoutchouc—
Boulogne, 3 cks.
Dyestuffs—
Alizarine
Rotterdam, 90 brls.
Madders
Rotterdam, 5 cks.
Logwood
Rotterdam, 10 cks.
Belize, 406 t.
Cuys de Ancona, 370
Laguna, 300
Dyestuffs *(otherwise undescribed)*
Boulogne, 77 cks. 5 cs. 3 pks.
Glucose—
Hamburg, 100 bgs. 60 cks.
Naphthylamine—
Rotterdam, 6 cks.
Potash—
Dunkirk, 20 drums. 20 cks.
Calais, 94 20
Saltpetre—
Rotterdam, 100 bgs.
Waste Salt—
Hamburg, 614 cks. 300 t.

TYNE.

Week ending August 20th.

Alum Earth—
Hamburg, 18 brls.
Barytes—
Rotterdam, 8 cks. Tyne Steam S. Co.
Phosphate—
Antwerp, 370 t.
Saltpetre—
Hamburg, 7 cks. Tyne S. S. Co.
Tartaric Acid—
Rotterdam, 8 cks. Tyne S. S. Co.

EXPORTS OF CHEMICAL PRODUCTS

OF

THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Aug. 13th.

Acids *(otherwise undescribed)*
St. Petersburg, 100 cs. £250
Ammonium Carbonate—
New York, 80 pkgs. £460
Yokohama, 30 cs. 57
Bordeaux, 25 cks. 109
Alum Cake—
Calcutta, 25 t. £100
Arsenic—
Wellington, 1 t. £17
Ammonium Sulphate—
Amsterdam, 50 £562
Bone Ash—
Mauritius, 148 t. 4 c. £685
Copper Sulphate—
Adelaide, 5 t. £98
Citric Acid—
Adelaide, 6 t. £37
Hamburg, 2 kegs. 14
M. Video, 1 ck. 35
B. Ayres, 10 brls. 67
Amsterdam, 6 kegs. 43
Oporto, 6 c. 40
Hamburg, 10 cks. 74
Moscow, 10 c. 69
Hamburg, 5 35
Odessa, 5 36
Lisbon, 10 kegs. 71
Genoa, 2 t. 14 315
Hamburg, 14 c. 99
Coal Products—
Pitch
Brussels, 6 cks. £20
Helsingfors, 150 t. 244
Boston, 1,000 brls. 442
Odessa, 400 135
Huelva, 766 t. 1,200
Benzole
Rotterdam, 30 cks. 63 drs. £1,541
" 40 796
" 48 257
" 20 398
Calais, 20 pns. 406
Rotterdam, 32 500
Hamburg, 16 270
Naphthaline
Hamburg, 35 cks. 20 cs. £37
Rotterdam, 134 bgs. 68
" 603 140
Treport, 27 58 cks. 76
Coal Products—*continued.*
Anthracene
Dusseldorf, 19 cks. £279
Rotterdam, 98 630
Tar
Malmo, 100 bls. £46
Helsingfors, 600 322
Stettin, 242 94
Sydney, 2 cks. 20
Karachi, 100 rlts. 55
Sydney, 298 drs. 74
Creosote
Gothenburg. 25 bls. £30
Huelva, 1,200 500
Carbolic Solid—
New York, 14 c. £78
Chlorate—
Yokohama, 150 kegs. £322
Hiogo, 100 211

Cream of Tartar—
Lyttleton, 1 t. 100
Sydney, 1 5 c. 129
Brisbane, 11 10 45
Adelaide, 1 13 177
Nelson 10 48

Caustic Soda—
Natal, 1 t. 5 c. £52
Adelaide, 11 28
,, 12 1 104
Pernambuco, 23 2 280

Caustic Potash—
Algoa Bay, 19 c. £36

Carbolic Acid—
Melbourne, 1¼ c. £41
Yokohama, 50 cs. 224

Disinfectants—
Wellington, 28 kgs. £36
St. Petersburg, 44 cs. 110

Guano—
Genoa, 150 t. £1,500

Hydro-Carbon—
Brussels, 2 t. £36

Insect Powder—
Algoa Bay, 4 cs. £22

Manure—
Stolpemunde, 160 t. £680
Memel, 929 10 c. 3,653
Reval, 96 18 314
Hamburg, 10 40
Madeira, 3 24
Rotterdam, 50 600
Hamburg, 62 744
,, 97 12 343
Adra, 49 6 500
Riga, 200 8 585
Stettin, 144 16 770
,, 73 4 256

Potassium Chlorate—
Odessa, 3 cks. £29
Calcutta, 13 c. 28
Sydney, 5 t. 214

Potash Crystals—
New York, 15 c. £30
Madras, 11 20

Phosphorus—
Hiogo, 1,700 lbs. £205
Yokohama, 20 cs. 217

Salammoniac—
Antwerp, 1 t. £34
Varna, 19 c. 31

Superphosphate—
Riga, 400 t. £1,200
Libau, 350 1,200
Lyttleton, 100 344

Saltpetre—
Wellington, 1 t. 10 c. £32
Melbourne, 1 22
Oporto, 1 17 38

Sulphuric Acid—
Madras, 5 cs. £15
Algoa Bay, 8 t. 15 38
Cape Town, 2 5 c. 60

Sheep Dip—
Algoa Bay, 25 cs. £66
E. London, 35 171
,, 50 140
Karachi, 300 36
Natal, 400 drs. 90
,, 500 101
,, 100 280
,, 100 280
,, 250 35
,, 500 106

Sulphur—
Cape Town, 4 t. 9 c. £47

Sodium Bicarbonate—
Canterbury, 5 t. £30

Tartaric Acid—
M. Video, 4 cs. £122
Nelson, 3 c. 20
Adelaide, 1 t. 128
Sydney, 60 pkgs. 390
Melbourne, 2 t. 253
Lyttleton, 5 c. 32
Sydney, 10 64
Adelaide, 1 134
Brisbane, 10 58
Melbourne, 1 5 165
Adelaide, 10 68

LIVERPOOL.

Week ending August 16th.

Alkali—
Havre, 46 cks.
Rotterdam, 34

Alum—
Montreal, 25 t. £128
Ibrail, 1 5

Alum—*continued.*
Kurrachee, 15 t. 3 c. 71
Melbourne, 1 6
B. Ayres, 2 1 10
Piræus, 4 6 21
Toronto, 4 19 25
Galatz, 1 9 7
Havana, 2 6 8
Melbourne, 6 4 1 q. 32
Montreal, 18 3 2 91
Alexandria, 3 15
Sydney, 3 15

Antimony Regulus—
New York, 10 t. 5 c. £709

Albumen—
New York, 1 t. 11 c. 3 q. £15

Ammonium Muriate—
New York, 8 t. 13 c. £199
,, 3 9 1 q. 75
Antwerp, 8 1 9

Ammonium Sulphate—
New York, 159 t. 7 c. £1,647
,, 73 10 888
,, 25 1 269
Valencia, 51 14 2 q. 599

Ammonium Carbonate—
Naples, 3 t. £100
Rouen, 10 c. 20
Hamburg, 5 2 q. 8
New York, 6 11 149
Hamburg, 11 1 17

Alum Cake—
Calcutta, 10 t. 17 c. £30
Alexandretta, 7 11 3 q. £23

Bleaching Powder—
Bombay, 8 cs.
Chicago, 40 bxs.
Genoa, 34 cks.
Nantes, 21
Termeuzen, 25
Treiste, 28
Antwerp, 28
Barcelona, 60
Boston, 324 83 tcs.
B. Ayres, 10 brls.
Cadiz, 4
Calcutta, 100 cs.
Carril, 6
Genoa, 63
Ghent, 166
Leghorn, 161
Montreal. 17 tcs.
Philadelphia, 96
Rotterdam, 3
Santander, 20
Lisbon, 16

Bisulphate of Lime—
B. Ayres. 3 t. 10 c. £80

Brimstone—
Para, 15 c. 2 q. £7

Benzoic Acid—
New Orleans, 500 ozs. £8

Borax—
B. Ayres, 19 c. £27
New York, 10 3 q. 15
,, 6 t. 4 2 171
Rotterdam, 2 2 3 57
Vera Cruz, 1 1 3 30

Citric Acid—
B. Ayres, 5 c. £36

Caustic Potash—
New York, 4 t. 11 c. £93
,, 4 11 93
Orilla, 4 7

Creosote—
Philadelphia, 5 c. £45

Caustic Soda—
Antwerp, 1,000 kgs.
Barcelona, 50 dms. 30 cks.
Bilbao, 30
Carthagena, 10
Corfu, 40
Genoa, 416
Mersyne, 15
Nantes, 124
New York, 200
Palermo, 10
Philadelphia, 150 brls.
Rio de Janeiro, 10
Santos, 20
Algoa Bay, 10
Alicante, 50
Antwerp, 36
Barcelona, 78 30 cks.
Boston, 200
Brisbane, 30
Carthagena, 4
Ceara, 70
Chicago, 100
Eten, 10
Fairwater, 70
Genoa, 284
Hamburg, 8
Hamilton, 50

Caustic Soda—*continued.*
Havana, 15
Hong Kong, 30
Malaga, 100 kgs. 40 10 brls.
Melbourne, 35
Naples, 10
New York, 880
Paraiba, 5
Paysandu, 50
Pernambuco, 30
Phiiadelphia, 100
Riga, 20
Rotterdam, 45
Rouen, 85
Savanilla, 20
Seville, 20 20
Singapore, 30
Tarragona, 10
Trieste, 20
Valencia, 112
Valparaiso, 25
Venice, 4
Vera Crus, 17
Yokohama, 100

Copperas—
Montreal, 10 t. 2 c. £19
San Francisco, 28 7 58
Aleppo, 3 12 8
Beyrout, 4 9

Charcoal—
Hamburg, 50 t. £256

Calcium Chloride—
New York, 10 t. £21

Chromium Trioxide—
Philadelphia, 1 t. 19 c. £122

Copper Sulphate—
Leghorn, 1 t. 8 c. 1 q. £29
Venice, 7 16 133
Antwerp, 2 14 2 47
Brindisi, 5 1 3 96
Rouen, 22 17 562
Santander, 7 2 3 122
Rotterdam, 5 18 1 101
Catania, 10 6 178
Fairwater, 5 1 105
Marseilles, 100 3 2 2,000
Nantes, 10 3 1 200
Hamburg, 33 10 79
Adelaide, 10 180
Antwerp, 1 13 3 29
Barcelona, 5 1 1 100
Bombay, 2 50
B. Ayres, 3 5 75
Santander, 13 3 185
Smyrna, 3 11 2 65
Stettin, 1 5 3 25
Valparaiso, 10
Rotterdam, 4 4 2 205
Rouen, 39 6 943
Genoa, 9 13 1 170
Leghorn, 1 2 18
Ghent, 10 3 9
Naples, 22 19 2 398
Montreal, 16 5 308
Hamburg, 2 2 36
Amsterdam, 3 11 2 67
Antwerp, 11 14 217
Odessa, 20 15 373
Rotterdam, 10 13 1 191
Santander, 8 2 170
Sydney, 5 94
Bilbao, 7 11 140
Odessa, 7 3 126
Palermo, 8 1 137
Leghorn, 19 2 17
Naples, 20 1 1 334

Carbolic Acid—
Philadelphia, 1 t. 5 c. £68
Rouen, 1 2 55
Carthagena, 3 3 q. 20
New York, 13 1 75
Hiogo, 1 15 82
Boston, 4 3 20
Havre, 2 9 175
New York, 2 168
Hamburg, 6 5 3 199
Montreal, 4 3 16

Chemicals *(otherwise undescribed)*
Bilbao, 4 c. £20
Malaga, 6 3 q. 15
Bari, 1 t. 2 2 38
Hamburg, 29 9 445
Rotterdam, 11 17 160

Disinfectants—
Calcutta, 13 cs. £6
New York, 9 t. 16 c. 2 q. £98
Rio del Bay, 7 2 10
New Orleans, 2 24

Dried Blood—
Montreal, 2 t. £40

Epsom Salts—
Montreal, 125 brls.
Rio de Janeiro, 50 kgs.
Maceio, 13 brls.
Rio de Janeiro 50 kgs.

Glycerine—
Rotterdam, 5 t. £75
New York, 45 1,880
Orebak, 5 c. 13

Gypsum—
New York, 10 t. 1 q. £30

Iodine—
Hamburg, 5 t. £3,000

Iron Oxide—
Ensenada, 20 t. 2 q. £50
Philadelphia, 7 16 c. 50

Magnesium Chloride—
Nantes, 5 t. 2 c. £12

Manure—
Rouen, 31 t. 5 c. £280
Madiera, 1 6
Malaga, 9 19 2 q. 97
Gr. Canary, 36 8 1 400
Havre, 55 11 1 864
New York, 2 5 14

Oxalic Acid—
Havre, 4 t. 1 q. £138

Potassium Carbonate—
New York, 17 t. 5 c. £241
B. Ayres, 1 4 1 q. 20

Picric Acid—
New York, 1 t. 17 c. 3 q. £212
,, 10 60

Pitch—
New York, 50 cks.

Phosphorus—
Monte Video, 7 c. 3 q. £88

Potassium Silicate—
Amsterdam, 1 t. 3 c. 3 q. £10

Potassium Chlorate—
Genoa, 5 t. £223
Hamburg, 1 47
New York, 15 600
Shanghai, 1 8 c. 71
Stockholm, 5 225
Boston, 5 233
Hiogo, 10 443
Genoa, 1 10 66
Copenhagen, 7 10 390
Philadelphia, 5 201
S. Petersburg, 6 10 280
Boston, 1 5 57
B. Ayres, 5 9
Hiogo, 11 3 443
Fairwater, 3 150
New York, 2 10 125
Valparaiso, 4 10
Corunna, 10 23
Havanna, 4 1 q. 10
Odessa, 1 45
Riga, 5 20
San Francisco, 1 5 55

Potashes—
Palermo, 2 . 17 c. 1 q. £64
Catania, 1 15 2 1

Potassium Nitrate—
Carthagena, 4 t. 19 c. 2 q. £87

Potassium Bichromate—
Seville, 8 c. £14

Sugar of Lead—
Rio de Janeiro, 6 c. 2 q. £9

Sheep Wash—
Natal, 4 t. 10 c. £225
PuntaArsenas, 1 3 60

Sodium Hyposulphite—
Portland, 1 t. 10 c. £10

Superphosphate of Lime—
Gr. Canary, 1 t. 1 c. 3 q. £5
Nantes, 125 9 218

Sodium Chlorate—
New York, 2 t. 10 c. £137
,, 1 £56
Stettin, 9 24

Salt—
Addah, 6 t.
Antwerp, 379
Brisbane, 300
Calcutta, 3,200
Chicago, 100
Copenhagen, 395
Iceland, 85
Manaos, 7 2 c.
Montreal, 1 6
Newcastle, 50
Para, 17 17
Rotterdam, 400
Salt Pond, 6¼
Valparaiso, 20 cs.
Hamburg, 30
Akassa, 567
Algoa Bay, 9
Benin, 20
Boston, 100
Buguma, 20
Calcutta, 1,150 10
Cape Coast, 10 8
Cape Town, 13

Salt—*continued.*
Chicago, 100 t.
Grand Bassa, 10
Manaos, 7
Montreal, 855
New York, 150
" 10
Opobo, 44 12
Orebak, 146
Para, 17 6
Shediac, 310
Sierra Leone, 300
Trinidad, 57 10
Valparaiso, 5

Sodium Bicarbonate—
Adelaide, 175 kgs.
Amsterdam, 25
Antwerp, 20 10 cks.
Calcutta, 500
Copenhagen, 15
Fairwater, 130
Genoa, 45 5 brls.
Halifax, 10
Hamburg, 20
Portland, 20
Rangoon, 20
Rotterdam, 83
Rouen, 120
St. Petersburg, 1,200
San Juan, 20
Valencia, 120 2
Vera Cruz, 400
Yokohama, 1,500
Antwerp, 165 16
B. Ayres, 50
Copenhagen, 100
Genoa, 120
Halifax, 50
Hamburg, 20
Konigsberg, 35
Malmo, 10
Montreal, 260
Naples, 100
Newfairwater, 60
New York, 200
Piræus, 100
Rotterdam, 25
Singapore, 4
Toronto, 100

Soda Ash—
Barcelona, 155 brls.
Boston, 800 bgs. 50 cks.
Brisbane, 162
B. Ayres, 100
Buffalo, 60
Cadiz, 5
Carthagena, 30
Chefoo, 10
Havana, 30 dms. 1
Leghorn, 40
Maceio, 15
Monte Video, 100
Montreal, 13 tcs.
New York, 1,587
Paysandu, 100
Philadelphia, 259
Rio de Janeiro, 100
Santos, 10
Smyrna, 112
Adelaide, 8
Baltimore, 73 365
Boca, 300
Boston, 720 bgs. 125 176
B. Ayres, 50
Ceara, 10
Corfu, 110
Georgetown, 59
Kingsey, 20
Maranham, 40
Magog, 4
Monte Video, 100
Montreal, 17 31
New York, 984 567
Para, 11
Paraiba, 20
Philadelphia, 350 91
Rio de Janeiro, 140
Rosario, 50
Santos, 10

Soda—
Montreal, 99 pks.

Soda Crystals—
Bilbao, 4 cks.
Boston, 140 brls.
B. Ayres, 10
Halifax, 50
Messina, 4
New York, 280
Philadelphia, 309
Smyrna, 50
Toronto, 200 kgs.
Piræus, 14
Constantinople, 10
Halifax, 15
Malta, 50
New York, 420
Philadelphia, 154 374
Toronto, 100

Sodium Silicate—
Bombay, 7 cks.
Brisbane, 15
Genoa, 134 brls.
Volo, 5
Carril, 6
Savanilla, 4
Seville, 84

Sodium Carbonate—
Boston, 56 brls.
Montreal, 20
Rotterdam, 50

Sodium Bichromate—
Bremerhaven, 11 c. 2 q. £15

Saltpetre—
Ceara, 10 c. £14
Valparaiso, 4 6

Sodium Sulphate—
Hamburg, 1 t. 17 c. 3 q. £10

Sheep Dip—
Cape Town, 124 drs. £28

Superphosphate—
Gr. Canary, 10 t. £26

Salt Cake—
Baltimore, 145 t. 18 c. £334

Sulphur—
Payta, 2 t. 14 c. £19
Pernambuco, 1 1 2 q. 7
Montreal, 50 5 226
Boston, 25 110
Para, 1 8 2 10
Portland, 250 1 1,092
Boston, 28 1 126
Para, 1 8 2 10

Salammoniac—
Malta, 2 t. 10 £77
Genoa, 1 17 3 q. 65
Trieste, 1 1 36
Genoa, 9 3 17
Mersyne, 1 9 2 52

Tar—
Gaboon, 5 brls.

Tartaric Acid—
B. Ayres, 6 c. £38
Matanzas, 6 42

Verdigris—
Boston, 2 t. £100

GLASGOW.

Week ending August 20th.

Ammonium Sulphate—
Demerara, 13 t. 2¾ c. £152
" 26 6 307
New York, 51 6½ 580

Ammonium Carbonate—
Christiania, 2 cks. 6 kgs. £15

Benzole—
Dieppe, 14 pks. £112

Charcoal—
Dieppe, 6 t. 14 c. £8

Muriatic Acid—
Bombay, 16 t. 18 c. £75

Manganese Oxide—
New York, 205¼ c. £97

Manure—
Demerara, 85 t. 14¾ c. £640

Nitric Acid—
Bombay, 263¼ c. £43. 15s.

Potassium Prussiate—
New York, 5 t. 6 c. £420

Pitch—
Antwerp, 730 t.
Gothenburg, 223¼ c. £600

Paraffin Wax—
Nantes, 4,480 lbs. £70
Fremantle, 36 c. 59

Potassium Bichromate—
Christiania, 1 ck. £13
Rouen, 21 t. 3 c. 588
Nantes, 1 17 65
Rotterdam, 31 cks. 383
Quebec, 74½ 125
Antwerp, 103¼ 160

Sulphur—
Demerara, 6 t. 15¼ c. £39. 11s.

Sodium Bichromate—
Rouen, 11 t. £285
Quebec, 73 c. 95
Antwerp, 5 t. 12¼ c. 140

TYNE.

Week ending August 20th.

Alkali—
Reval, 55 t.
St. Petersburg, 19 18 c.
New York, 50

Alkali—*continued.*
Antwerp, 2 17
Amsterdam, 36 8
" 7 1
Hamburg, 5 4
Rotterdam, 11
Horsens, 1 11

Antimony Star—
Montreal, 1 t.

Ammonium Sulphate—
Genoa, 20 t.
Valencia, 50

Baryta Sulphate—
Genoa, 9 t. 15 c.

Baryta Nitrate—
Genoa, 1 t.

Barytes Carbonate—
Antwerp, 10 t.
" 10

Bleaching Powder—
Genoa, 20 t. 6 c.
St. Petersburg, 50
New York, 50 4
Antwerp, 23 18
" 1 3
Amsterdam, 22 13
Hamburg, 3 3
" 30 14
Christiania, 25 4
Rotterdam, 14 8
" 10 10
Horsens, 1 10
Copenhagen, 3 10
Libau, 30
Riga, 35 9
St. Petersburg, 80 2
" 125 10

Caustic Soda—
Genoa, 29 t. 2 c.
Leghorn, 2 6
New York, 87 1
Antwerp, 6 2
Amsterdam, 4 18
Seville, 22 12
" 25 2
Montreal, 33 7
Bilbao, 17 8
St. Petersburg, 116 1

Copper Sulphate—
Aarhuus, 3 c.

Glycerine—
Rotterdam, 7 t. 11 c.

Litharge—
Antwerp, 18 c.
Amsterdam, 1 17
Christiania, 5
Montreal, 15

Magnesia—
St. Petersburg, 6 t. 12 c.
Antwerp, 1

Potassium Chlorate—
Rotterdam, 5 t. 10 c.

Pitch—
Montreal, 35 t. 5 c.

Sodium Bicarbonate—
Aarhuus, 1 c.

Sodium Carbonate—
Amsterdam, 1 t. 10 c.

Sodium Silicate—
Seville, 5 t. 16 c.

Salt—
Aalborg, 5 t.

Superphosphate—
Aalborg, 121 t.
Horsens, 1 15 c.
Thisted, 3 4
Nykjobing, 11
Riga, 100 3
Aarhuus, 33 7

Soda—
Aalborg, 10 t. 2 c.
Svendborg, 6 9
Odense, 7 2
" 39 1
Copenhagen, 30 2
Aarhuus, 10 15
Holbek 30 1
Middlefart, 70 4
Grenaa, 29 16
Aarhuus, 28 17
Frederikshavn, 5 7
Montreal, 32 10

Soda Ash—
Horsens, 2 t. 16 c.
Odense, 3 7
Odessa, 5

Sodium Sulphate—
Copenhagen, 3 t. 6 c.
Katomka, 20
Riga, 10 3

Sulphur—
Rotterdam, 6 t. 10 c.

HULL.

Week ending August 19th.

Bleaching Powder—
Bergen, 30 cks.
Dronthiem, 31
Stettin, 133

Bone Size—
Ghent, 4 cks.
Harlingen, 16

Caustic Soda—
Abo, 5 drs.
Hamburg, 1 ck.
Helsingfors, 104 drs.
Libau, 38
New York, 1 colt
Drontheim, 17

Chemicals *(otherwise undescribed)*
Antwerp, 2 cks.
Amsterdam, 10 4 pks.
Bremen, 44 2 cs.
Bergen, 25 1
Bombay, 2,166 100 pks.
Copenhagen, 1 cs
Christiania, 21 6 pks. 5 cs.
Christiansand, 37 slbs.
Drontheim, 14
Dunkirk, 30 30 drs.
Gothenburg, 34 65 cs. 623
Hamburg, 46 145
Helsingfors, 19 35 pks.
Konigsberg, 20
Lisbon, 20 11
New York, 40
Rotterdam, 35 40 10
Stettin, 3 5
St. Petersburg, 3

Dyestuffs *(otherwise undescribed)*
Antwerp, 2 cks.
Bergen, 1 cs. 1 bl.
Hamburg, 1 8 drms.
Kurrachee, 20
Rotterdam, 1 kg. 2 cks.
St. Petersburg, 77

Manure—
Aalborg, 250 t.
Copenhagen, 231
Esbjerg, 392
Hamburg, 878 bgs.
Stettin, 1,720

Pitch—
Antwerp, 50 t.

Turpentine—
Bergen, 35 cs. 2 cks.
Bombay, 40 drms.

Tar—
Bombay, 100 cks.
Gothenburg, 160
Hamburg, 12

GOOLE.

Week ending August 13th.

Alkali—
Boulogne, 3 cks.

Bleaching Preparations—
Antwerp, 72 cks.

Benzole—
Antwerp, 24 cks.
Rotterdam, 133

Coal Products—
Rotterdam, 317 cks.

Chemicals *(otherwise undescribed)*
Hamburg, 60 cks.

Dyestuffs *(otherwise undescribed)*
Boulogne, 3 cs. 4 cks. 4 drs.
Rotterdam, 1 2 67 bgs.

Manure—
Boulogne, 238 bgs.
Hamburg, 168
Rouen, 288
Rotterdam, 1 ck.

GRIMSBY.

Week ending August 16th.

Chemicals *(otherwise undescribed)*
Antwerp, 25 cks.
Dieppe, 4 60 pks
Hamburg, 2

Dyestuffs *(otherwise undescribed)*
Hamburg, 12 cks.

PRICES CURRENT.

WEDNESDAY, August 27, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	62/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3½
Picric .. .. ,,	0	1	0½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. per ton	11	15	0
,, ,, (grey), Hull .. .. ,,	11	12	6
Aniline Oil (pure) .. .. per lb.	0	0	11
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	10	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	11	10	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	4
Benzol, 90 % nominal .. .. .. per gallon	0	4	3
,, 50/90 ,, ... ,,	0	3	3
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7¼
,, (crude 60°) .. .. per gallon	0	2	0
Creosote (ordinary) .. .. ,,	0	0	2½
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	5	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	60	10	0
,, Sulphate .. .. ,,	19	0	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	2	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	6
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	0	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	0	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	5	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	6
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	5	17	6
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	11	15	0
,, ,, (74 % Caustic Soda) ,, .. ,,	11	5	0
,, ,, (70 % Caustic Soda) ,, .. ,,	10	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	9	12	6
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	0	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	3
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¼
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5½
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	8	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	100	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	24	0	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	5	0

THE

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THE DIFFUSION OF POISONS.

ONE of the most startling pieces of evidence we have ever read, relative to the distribution of poisons, appears from the daily press to have been given at the police court in Manchester, at the investigation before the magistrates of what is now known as the Ardwick poisoning case.

"Martin O'Rourke said he was employed as arsenic acid maker at Messrs. Kupferberg and Co.'s works. The firm used white arsenic extensively. They got it in tubs containing 3½ cwt. each. The tubs were opened on a stage under a shed open to the yard at one side. After the tubs were emptied, they were knocked and then washed, and then they were piled up in another covered shed about eight yards from the shed in which they were emptied. They were then sold as washing tubs or for any other purpose to any person who liked to come to the yard to buy them. He remembered Corfield coming to the works on two different occasions to buy empty tubs. He came with a pony and cart, and on his last visit he took away six or eight tubs, intending, as witness thought, to sell them to anybody who would buy them."

"Jessie Hothersall also said her husband had a horse and cart, and did anything he could in the way of portering. She assisted him. Sometimes they bought empty arsenic tubs to sell again for washing tubs. She had known Corfield for over two years. She sometimes employed him to drive the cart. He had been with her three times with the cart to Messrs. Kupferberg's to get arsenic tubs. Corfield knew that the tubs had contained arsenic, because they were cautioned to wash their hands after handling them. The last time Corfield went with her to the works was Monday, July 7. He had not worked with her since that week. Her husband had more than once talked to Corfield about arsenic being a dangerous poison. It often made her hands and face sore after handling the tubs."

It seems almost incredible that any firm of manufacturers, knowing the deadly character of a substance like arsenic, should run any risk of adding to our preventible deaths, for the sake of the few pence which the sale of these tubs would produce. Knowing that the use of arsenic in large quantities is pretty widely distributed, and that it is employed in several distinct industries, we had often wondered what became of the packages in which it is contained. This point is now cleared up—not, however, in a very satisfactory manner, when we consider that the ultimate destination of these tubs is amongst a population almost absolutely devoid of technical knowledge.

It may be urged that these tubs or casks are washed before being delivered to the purchasers, but we have Jane Hothersall's evidence, that her hands and face were often made sore after handling them, which certainly goes to show that there was still sufficient arsenic adhering to cause mischief.

We are strongly of opinion that packages which have once been employed to hold these dangerous articles should at once be destroyed when they have been emptied of their contents, and that this should apply to wooden packages in particular. There is, in such cases as we have already noticed no guarantee that they will not at some time be used by the ignorant, as a cover or receptacle for food stuffs, and after an arsenic cask has changed hands several times, the fact that it

at one time contained arsenic is soon forgotten, and may lead to disastrous consequences.

It is not only to arsenic tubs that our remarks apply. There are many other poisons used largely in trade, which are distributed in barrels, and we may now fairly ask—what is done with these?

No doubt, many of these matters are not inquired into by the proprietors of the various establishments, on account of the apparent smallness of detail, and are left to be dealt with by some subordinate, who, lacking the necessary foresight, allows things to be done that would not be permitted upon mature consideration.

We trust that these few remarks will lead to a much stricter supervision over the disposal of packages that have contained poisonous substances, so that in future, we may have no more evidence of the character indicated by the quotations in the earlier part of this article.

THE CHEMICAL UNION.

THIS subject, says the *Liverpool Journal of Commerce*, is now at the height of discussion. Still, where there is a demand, there will, or rather there must be, a supply. Such is one of the first principles of commercial economy. It would be puerile to say that in the distant future there would be no new field open capable of coping with such an institution, but efforts of opponents at the time being are handicapped. Competition is always promotive of trade, and wherever there is a *con* one will find a *pro*. Messrs. Peter R. M'Quie and Son, of Adelphi-chambers, 19, South John-street, Liverpool, look upon matters calmly. They point out that the latest feature in connection with the union is the determination to postpone the settlement for another month, and to leave makers in possession of their works until the 1st of November next. This decision has been made upon financial grounds, and in view of the fact that so many leading capitalists are at present away from home on their annual vacation. It is, however, authoritatively stated that this in no way affects the ultimate consummation of the union, but is rather a proof that the extension of the temporary agreements with the makers (and which expire during the course of next month) may be looked upon as perfectly safe in all cases, a statement that may be easily understood by a reference to our last advices. With regard to the alkali market generally, caustic soda has again absorbed the chief interest, and shows a material advance on last quotations, and as an evidence of scarcity we note that present prices are 7s. 6d. per ton above the minimum figures fixed by the union promoters for October delivery. Large sales of soda ash and bleaching powder are said to have been made over all next year, and several manufacturers report themselves sold out to the extent of their 25 per cent. limit. Such an union as the Chemical Union is calculated to affect the paper trade. It will not, however, reduce the price of the daily or the evening paper. It is a sad admission, but a true one, that for many years the majority of paper upon which British and foreign news is printed comes from Hamburg. The esparto grass comes from Oran, and we know that within the period of not many months ago a late member for a Scotch constituency was interested in teaching a lesson to Customs officers for unfolding a reel of paper that they could not refold. The Chemical Union had nothing to do with such, and it is hence absolutely untrue that paper bleaching as an investment is keeping success from the Chemical Union.

THE PROPOSED CHEMICAL UNION.

THE following letter appears in the *Times* of September 4th :—

Sir,—The remarks which appeared in your Money Article of 29th of August, on the subject of the proposed amalgamation of [illegible]l works, contain assertions which are at once so inconsistent with the facts and so injurious to the reputation of the committee engaged in the organization of the scheme, that, appearing as they did in the columns of the *Times*, they demand a specific reply.

The writer of the remarks in question states that the Leblanc process has for some years been superseded by the Solway process, in which ammonia is used; that the machinery used in the Leblanc process is "old" and "obsolete," and the process itself "antiquated;" that "most of the works have been carried on at a loss for a year or two past, and that those which have contrived to make profits were only able to do so because the ammonia works had not until quite recently been able to produce bleaching powder cheaply." The writer has been strangely and entirely misled in these respects. The Leblanc process is neither "antiquated" nor "superseded," but is, as it has always been, the only one by which bleaching powder is successfully manufactured.

Carbonates of soda, of which the most important is soda ash, are practically the only products in which the ammonia soda process has come into successful competition with the Leblanc process.

Bleaching powder has not been successfully manufactured on a commercial scale by the ammonia process, and that product is an essential material in the making of paper. It may further be mentioned incidentally that the annual consumption of bleaching powder amounts to about 150,000 tons.

So far from the machinery used in the Leblanc works being either "old" or "obsolete" it has of late years, at the cost of hundreds of thousands of pounds, been improved and modernized to such a degree as to bring it into a state of perfect efficiency.

Not only is it not true that "most of the works have been carried on at a loss for a year or two past," but, on the contrary, it is a fact that most of the works have during that time been carried on to a profit; and it does not in any way affect the correctness of this assertion that some manufacturers have invested, in enlarging their works, profits which would otherwise have been legitimately available for distribution.

It is under all these erroneous impressions that the writer in question insinuates that "it is natural enough that the proprietors of the Leblanc works should have tried to establish an association on the lines of the Salt Union, in the hope that the public might be induced to purchase their works," an insinuation which we submit is altogether unwarranted.

Again, the writer states, "it is urged by the promoters of the scheme that they will, by their combination, be able to raise the prices of soda and other chemicals sufficiently to make their business pay;" and it is suggested that consumers will not "quietly submit to having the price of an important raw material raised 50 or 60 per cent." when they can prevent it by starting works of their own. There is no "promoter" or promotion money in connection with the proposed company, and the organizers of the scheme, who are all chemical manufacturers themselves, would not seek to raise the price of chemicals unduly.

Foreign competition alone would effectually prevent this. It seems to us that the papermakers and other large consumers, and, through them, the Press have been misled by unfounded statements and by misapprehensions of the policy and effect of the proposed amalgamation. It will tend very materially to remove these misapprehensions, and to allay the fears of the consumers, if we now state that the manufacturers are generally prepared to contract with consumers for bleaching powder at prices not exceeding the average of the last six years, and for caustic soda at the present market prices. Similarly, as regards other articles produced by the works, the proposed company would have no occasion to raise prices in order to secure a profit.

If the papermakers or other consumers of bleaching powder were to erect works to provide for their own consumption, these works must necessarily be constructed to manufacture, not by the ammonia process, but by the Leblanc process; and it would certainly cost them more to produce their material than the price at which the proposed company would be prepared to supply them.

Amongst the main objects in view in organizing the proposed company will be to secure the increased efficiency of all the manufactories, by applying to each the highest standard of working which the best experience of the trade may show to be possible, and to secure the economies which will necessarily result from unity and concentration of management, and from the important reduction of cost of transit effected by supplying the products from those works which are situated nearest to the consumer.—We are, Sir, your obedient servants,

Charles Tennant.	Charles Wigg.
Edward Sullivan.	J. E. Davidson.
James H. Dennis.	E. K. Muspratt.
John Brock.	Thos. Alexander.
James C. Stevenson.	James Tennant.

September 2nd.

WASHING SULPHITE CELLULOSE.

THE following is an abstract of a paper on the above subject by Mr. W. Palmaer, appearing in the *Papier Zeitung*, No. 70, 31st August, 1890.

The sulphite cellulose was obtained from a recently erected Swedish works. The investigation was carried out in the laboratory of the University of Upsala.

When the manufacture was begun, the cellulose obtained assumed a reddish colour after exposing it to the air for a short time. It was believed that this change in colour was due to imperfect or insufficient washing, and in order to ascertain whether this was so the wash water and cellulose were investigated during different periods throughout the washing operation.

After the process of digesting the wood in bisulphite of lime was finished, the contents of the boiler were emptied into a vessel containing a perforated bottom, so as to allow the brown lye to flow away. The pulp was then washed a little, mixed with water, and finally pumped into the breaker, where its disintegration and washing was completed. Samples of the wash water and cellulose were taken immediately after filling the breaker, and at intervals of half an hour during the two hours the pulp was washed. The samples of cellulose were simply squeezed by hand to remove the water. Samples of other wash waters and celluloses were obtained for comparison.

The method of analysing the samples was as follows:—The sulphurous acid (SO_2) in the wash-water was oxidised with bromine water to sulphuric acid (SO_3), and this estimated as $Ba\,SO_4$. The moisture, ash and sulphur, were determined in the samples of pulp. The "air-dried" cellulose was weighed, and then moistened with a solution containing a known quantity of soda, in order to prevent the escape of free sulphurous acid. All the samples were then dried at 110° centigrade, till the weight of each remained constant, and then each was completely incinerated. The ash was dissolved in water, and after oxidation the sulphuric acid was determined by precipitation with $Ba\,Cl_2$. The $Ba\,SO_4$ obtained was calculated to sulphur. The results of these analyses are given in the following tables.

"A" Wash water.	Grammes SO_2 in 100 c.c's. of wash-water.
At the beginning of the washing	0·0404
After washing ½ an hour	0·0187
,, ,, 1 hour.....	0·0106
,, ,, 1½ ,, ...	0·0068
,, ,, 2 ,, ...	0·0048
Water flowing from the hydraulic press	0·0044

The first water showed a very weak acid reaction arising from the presence of free sulphurous acid; the other samples were neutral.

"B," Cellulose.	Sulphur.	Corresponding amount of sulphite of lime.	Ash.	Moisture.
1 Cellulose filled into the breaker	0·32	1·2	1·45	10·24
2 Cellulose after washing for ½ an hour.....	0·34	1·3	1·40	9·44
3 Cellulose after washing for 1 hour	0·22	0·81	1·06	9·51
4 Cellulose after washing for 1½ hours	0·23	0·85	1·06	9·94
5 Cellulose after washing for 2 hours	0·19	0·71	0·96	9·88
6 Cellulose from middle of sheets from hydraulic press	0·18	0·66	—	8·55
7 Cellulose from edges of sheets.....	0·18	0·66	—	8·41
8 A better prepared, washed, and pressed pulp. Same make as above	0·10	0·37	0·38	8·44
9 A better prepared, washed, and pressed pulp. Another make	0·09	0·35	0·45	7·20

Samples Nos. 1 to 5 inclusive were dried in the air for four weeks; Nos. 6 to 8, for eight weeks; and No. 9 for nine months.

It is apparent that the quantity of SO_2 sinks to 0·2% after washing for an hour, and then remains nearly constant. This is due to the fact that all free SO_2 is removed during the first hour, and that the neutral sulphite of calcium which remains is so sparingly soluble in water (one part sulphite of lime in 8,000 parts of water) is removed with difficulty. By continued washing the sulphite of calcium does not diminish much as is shown from tests 3 to 7 inclusive. The analyses of the corresponding samples of wash-water also show that the quantity of neutral sulphite of lime taken up or dissolved by the water is very small. When the cellulose is sufficiently broken up in the breaker, it is of no use continuing the washing. The percentage of ash shows that besides calcium sulphite, only 0·1 to 0·3% of inorganic substances occurs in the cellulose.

The red colour of the washed cellulose does not arise from insufficient washing, as the neutral sulphite of calcium remaining in the pulp is wholly without action. It is much more probable that the lignin (by which term all incrusting substances are included) was not completely removed, owing to faulty boiling. This lignin is coloured red by oxidising substances, such as chlorine, nitric acid, etc., and it appears likely that air (oxygen) has the same action.

From the determination of the moisture, it appears that sulphite cellulose which has been exposed to the air for a long time contains 7% water.

WHITE LEAD BY ELECTROLYSIS.

THE new electrolytic process for the production of white lead is now in practical operation, and there appears to be no doubt of its commercial success. Estimating its production in expenditure of horse power, 152 pounds per day per horse power, or 27½ tons per year, is the result. The process may be briefly described as follows, employing technicalities as little as possible:

A solution is first prepared by dissolving sodium nitrate and ammonium nitrate in water in the proportion of 1 gallon of water to ½ pound of each of the nitrates. This solution must be saturated with carbon dioxide, which is best obtained by burning limestone, washing the gas thus produced, and supplying this gas directly to the solution while in the tank and subjected to the electrolytic action. After the solution has been placed in the tank, electrodes of metallic lead are immersed in it, and an electric current from a generating dynamo passed between them through the solution, and pure white lead is rapidly precipitated by the action. From time to time the white lead is removed, washed, and dried, and may then be mixed with a suitable article to form paint. The supply of carbon dioxide must be maintained throughout the operation.

The white lead thus formed by electrolytic action, besides being produced more cheaply than heretofore, is found to have greater covering properties and to go further in actual use. Moreover, not the least valuable feature of this invention is that it substitutes an innocuous process for the very injurious operation of dissolving lead in acetic acid in the presence of carbonic acid. Thus electricity has added another boon to mankind. The discoverer of the process is Mr. Turner D. Bottome, of Hoosick, N. Y., U. S. A.—*Scientific American.*

EFFECTS OF DELAY IN PASSING THE TARIFF BILL.

THE delay in passing the Tariff bill has already seriously injured home industries, as it has given foreign exporters time to anticipate and neutralize the new rates of duties by bringing immense quantities of goods into our markets. The New York *Commercial Bulletin* says:

Turning to the imports, it should be noticed first that there was a very large increase in June, especially in some of the articles in which duties would be increased by the pending Tariff bill. Some of the changes in value of imports for the month of June, 1890 and 1889, indicate clearly how considerable has been the importation to anticipate the possible advance of duties:

	1890.	1889.
Woollen goods.....	$7,236,149	$3,323,880
Wool	1,983,511	733,397
Silk goods	3,489,440	2,371,840
Tin plates	2,290,766	1,754,052
Glassware	758,562	507,047
Flax and hemp manufactures ..	3,471,025	1,804,912
Cotton goods	2,289,168	1,295,441
Earthenware	664,598	466,288
Total.....	$22,183,200	$12,257,747

In these few items there appears an increase of about $10,000,000 for a single month, and this increase is notably greatest in the articles in which the proposed change of duty is most important. In all articles free of duty the increase in imports was but $638,735, or about 3 per cent., while in all dutiable goods the increase was 33·7 per cent. The phenomenon which for several months past has so much affected the course of foreign trade is therefore the direct result of an endeavour to raise duties on imported articles of consumption, the bill having been lying in the Senate two and a half months without action.—*American Economist.*

OIL MORDANTS.

VARIOUS oily and fatty mordants have been used in dyeing for a long period, more especially in connection with the production of colour from madder and other natural dyewares. The Hindu dyers are very successful in obtaining good reds from madder, part of their process consisting in steeping the cotton in milk, and there is no doubt that the fatty and casin matters in the milk are the active ingredients. In Europe, Turkey-red and madder dyers were well acquainted with the fact that by using oil, the colours were rendered more brilliant, and the oil they used was the commonest then obtainable—namely, olive oil. This oil is the product of a characteristic European tree, the olive tree *(Olea Europea)*, which grows very luxuriantly on the shores of the Mediterranean. The oil varys much in quality, being dependent partly upon the climate of the place where it is grown and partly upon the care taken in extracting it from the firuit. The best is used for edible purposes, and comes into this country from Spain and Italy. The inferior qualities of olive oil are used for soap making, lubricating machinery, wool batching, and other purposes. These qualities are all imported from the Mediterranean States, Spain, Italy, Candia, Zante, Tunis, Mogador, etc. Perhaps the best known variety of olive oil is that of Gallipoli, a town in Italy. (There is also a town of the same name in Turkey.) The oil obtained from these places is generally of poor quality, and contains much free acid; the writer has found as much as 25 per cent. in some samples.

By exposure to air, olive oil becomes rancid, owing to the development of free fatty acid. This rancid oil is generally considered to be superior to the good fresh oil for dyeing purposes; in France it is known as *huile tournante*. Olive oil consists essentially of two bodies: olein (not to be confounded with olein described below) or glyceryl oleate,= $C_3H^5(C_{18}H_{33}O_2)_3$, a compound derived from glycerine, $C^3H^5(OH)^3$; and the fatty acid, oleic acid, $HC_{18}H_{33}O_2$; and stearin, glyceryl stearate $C^3H^5(C_{18}H_{35}O^2)_3$, a compound of glycerine and stearic acid $HC_{18}H_{35}O_2$. There are also present small quantities of palmitin, glyceryl palmitate $C^3H^5(C_{16}H_{31}O_2)^3$. Olein is a liquid oil present in nearly all oils; stearin and palmitin are solid fats, and it is the separation of these in a solid form that causes olive oil to congeal in cold weather. On being boiled with a solution of caustic soda, olive oil undergoes saponification, the glyceryl is separated out in the form of glycerine, while the oleic and other fatty acids combine with the alkali to form soap (sodium oleate $NaC_{18}H_{33}O_2$ and stearate $NaC_{18}H_{35}O^2$). Cold solutions of soda do not produce complete saponification, but an emulsion is formed due to the combination of the free acid present in the oil with the alkali to form a soap, and this helps the remaining oil to emulsify better; the more rancid the oil is the more of this soap is formed, and the better and the more complete is the emulsification. It is on this account that rancid oil is preferred to fresh oil for dyeing.

Although our knowledge of the chemistry of dyeing Turkey-red has considerably increased of late years, yet the part played by oil in its production—beyond the practical fact that the colour when oil is used is brighter and faster than when the oil is omitted—is not very clearly made out. There is no doubt that the oil, or probably the fatty acid of it, enters into the composition of the colour lake that is found on the fibre. Some old authorities have considered that the fatty acid of the oil becomes combined with the alumina and then this fatty compound combines with the alizarine to form the colour lake. If this were the case soaps ought to answer the same purpose as the oils, but as a matter of fact they do not; soap cannot replace oil in the Turkey-red process. Probably by the combined action of the air and alkali the oil undergoes a certain amount of decomposition, glycerine is liberated, the fatty acid becomes oxidised in a manner not properly understood, and this oxidised acid has a stronger affinity for both alizarine and alumina than the simple fatty acid, and forms with them the brilliant red lake on the fibre that is characteristic of Turkey-red.

The use of olive oil for dyeing is gradually becoming obsolete, if, indeed, it is not already so, having been replaced by a preparation of castor oil known as oleine, Turkey red oil, alizarine oil, and sometimes (but erroneously so) as soluble oil. Although they have only lately come into extensive use, yet these were proposed to be used by Runge as long ago as 1834, but then without success.

These oils are prepared by acting on the oil with sulphuric acid, then washing the product with water, and afterwards neutralising the oil with caustic soda or ammonia, when a clear oil is obtained, which mixes with water in all proportions. These sulphated oils are sold of various strengths, usually containing 25, 50, or 75% of oil acid. Generally the price at which it is sold regulates the strength; it is best to buy the strongest, and to dilute it down with water as may be required. They vary somewhat in their degree of miscibility with water; some mix perfectly with it, forming a clear solution, while others give a whitish emulsion. These latter generally contain a slight excess of acid or alkali, while those that dissolve clear are usually neutral or faintly alkaline. Dyers prefer an oleine that contains a slight excess of acid, but for finishers' use a neutral oil gives the best results. Castor oil consists almost entirely of a body known as ricinolein, a compound of ricinoleic acid $HC_{18}H_{33}O_3$ and glycerine; there are also small quantities of palmitin or stearin, and of a nitrogenous principle, to which its medicinal properties are probably due.

From the researches of Frémy, Runge, Müller, Jacobs, Liechti, Suida, and others, although the chemistry of the sulphated oils is by no means clear, yet it is evident that oleine consists essentially of three substances:—1st, unaltered oil; 2nd, sulpholeic or sulphoricinoleic acids, according as olive or castor oils have been used in making it; 3rd, oxyleic or oxyricinoleic acids, as the case may be. These acids exist in the oil as alkali salts. The sulpho acids have the composition shown in the formulæ,

$C_{17}H_{32}HSO_3COOH$ Sulpholeic acid. $C_{17}H_{32}OHSO_3COOH$ Sulphoricinoleic acid.

These bodies are soluble in water; when heated with it they undergo decomposition into sulphuric acid, and into the crystalline insoluble oxyoleic or oxyricinoleic acid. The sulpho acids, especially the sulphoricinoleic acid, have a strong solvent action on oils. This combined with its readier solubility is probably the reason why oleine prepared from castor oil is preferred to that prepared from olive oil.

The oxyoleic and oxyricinoleic acids are bodies which are insoluble in water. They have the formulæ:—

$C_{17}H_{32}OHCOOH$ Oxyoleic acid. $C_{17}H_{33}(OH)_2COOH$ Oxyricinoleic acid.

They are present in small quantities only in oleine, and the amount depends on the temperature at which the operation is carried on; the higher it is the more is formed. Their alkaline compounds dissolve in water, forming cloudy, soapy-looking solutions, which are unaffected by boiling. The value of oleine as a mordant probably depends on the fact that they contain a large amount of unchanged oil dissolved in them, and hence in a form in which it can be readily taken up by the fibre, and thus be ready to combine with the alumina in subsequent operations of the dyeing process.

When dilute sulphuric acid is added to the oleine the fatty acids are set free, and being lighter than water, rise to the top of the mass as an oily viscid body. The fatty acid obtained from castor oil oleine, in this way is entirely soluble in alcohol, while that obtained from other oils is not. The value of oleine depends upon the amount of these fatty acids it contains. The best way of ascertaining the amount of these is to weigh out 10 grammes, dissolve in a little water, add sufficient dilute sulphuric acid to completely decompose the oil, and then a little concentrated salt solution, heating the mixture until the oil acids are fairly melted; then add 10 grammes of white wax, heating till the wax is melted and properly incorporated with the oil acids; then allowing to cool, collecting the cake, drying it, and weighing it, and deducting the weight of the wax to get the weight of oil acid in the oleine.

ACIDS OF LOW CARBON PERCENTAGE OCCURRING IN BAKU PETROLEUM.

ABOUT two years ago, O. Aschan procured for the purpose of this investigation, from Estlander of Baku, about 200 kilos. of crude naphtha acids which had been separated from the residue obtained in the purification of petroleum with caustic soda, by adding water to the semi-fluid mass and heating to 90—100 deg. for 48 hours. The clear solution was then treated with sulphuric acid, and the acid thus obtained separated by decantation. The crude acid has a light yellow colour and petroleum-like odour, and shows a specific gravity of 0.9891 at 18 deg. When subjected to distillation at the ordinary pressure water and hydrocarbons begin to come over; at 200 deg. the acid commences to boil with partial decomposition. The greater portion boils above 300 deg., only one-third distilling over below this temperature.

Hell and Meidinger some time ago isolated from crude Wallachian petroleum an acid having the formula $C_{11}H_{20}O_2$. Markownikow and Oglobin obtained two acids, to which they assigned the formulæ $C_{10}H_{18}O_2$ and $C_{11}H_{20}O_2$, whilst Kramer has recently isolated an acid of the formula $C_{15}H_{30}O_2$. The extensive researches made by Markownikow appear to show that the acids belonging to the group represented by the general formula CnH_{2n-2O_2} are the carboxylic acids of hydrocarbons of the CnH_{2n} series, called naphthenes, which constitute the principal part of Caucasian petroleum. The same author has recently shown that the naphthenes are hexahydrides of benzine hydrocarbons, so that the corresponding acids must be regarded as hexahydroxybenzoic acid and its homologus. Of these acids, those represented by simple formulæ are of the greatest interest, as the higher homologues, which contain several isomers, cannot be isolated without considerable difficulty. The author has therefore separated and examined the lowest boiling acids. For this purpose the crude naphtha

acid was subjected to distillation, and the distillate up to 270° collected. This was then treated with a 5 per cent. solution of caustic soda, and after standing for two days, the petroleum layer was drawn off and the aqueous solution decomposed with sulphuric acid, A colourless oil was obtained which assumed a dark colour when exposed to light. One hundred kilos of crude gave six kilos of low boiling products. In order to isolate the various acids the mixture was methylated, and subjected to a long series of fractional distillations. In this manner the methyl ether of hexanaphthenecarboxylic acid was obtained. It boils between 165·5° and 167·5°; forms a colourless oil, of 0·90547 sp. gr., having an agreeably fruity odour, which, however, eventually excites nausea. The free acid was prepared by dissolving the ether in alcohol, boiling the solution with a slight excess of potassium hydroxide, and decomposing the potassium salt thus formed with an acid. A yellow oil was obtained, which, after refining, boiled at 215° to 217°, and gave by analyses numbers agreeing with the formula $C_7H_{12}O_2$. Hexanaphthenecarboxylic acid is a colourless oil possessing a strong odour of valerian. It has a specific gravity of 0·95025 at 18.4°. Bromine has no action at the ordinary temperature, but on heating, substitution takes place. Potassium permanganate in alkaline solution is gradually decolourized. Nitric acid causes slow oxidation. Hexanaphthenecarboxylic acid has strongly acid properties. It is isomeric with the synthetical methylpentamethylenecarboxylic acid (2 : 1) recently prepared by Perkin, jun., and Colman.

The following salts have been prepared: The potassium salt is readily soluble in water and alcohol, and is highly hygroscopic. The sodium salt is obtained from alcohol in the form of indistinct flat prisms, which effloresce on heating. The calcium salt is readily soluble in alcohol and water, and crystallizes in two forms containing different amounts of water. The barium salt is readily soluble in alcohol, sparingly soluble in water, and forms two modifications. The amorphous salt contains water, and the crystalline salt is anhydrous. The silver salt is sparingly soluble in cold, more readily soluble in hot water. The cadmium salt forms nacreous laminæ sparingly soluble in cold, readily soluble in hot water. The ammonium salt cannot be obtained. On driving, ammonia is liberated and the acid reproduced. The author has also prepared the chloride, amide and anilide. The chloride boils at 167° to 169°. The amide melts at 123·5°, and is readily soluble in alcohol a nd water. The anilide crystallizes in long needles which melt at 93° to 94°. Of the homologues of hexanaphthenecarboxylic acid two acids represented by the formulæ $C_8H_{14}O_2$ and $C_9H_{16}O_2$ have been prepared in a pure form; they boil at 237° to 239° and 251° to 253° respectively, and their properties will be described by O. Aschan in a future communication.—*Oil, Paint, and Drug Reporter.*

BLEACHING FIBROUS MATERIAL BY AID OF ELECTRICITY.

AN invention referring to those bleaching processes in which the bleaching agents are prepared electrolytically has for its objects not only to economise power in the production of the electric current required for the electrolysis, but also to economise chemicals. In those cases where electrolytic processes have been employed in bleaching fibrous materials in the manufactured or in the raw state, it has been usual, hitherto, to prepare the bleaching agents in a separate vessel, by the decomposing action of an electric current, and, afterwards, to use them in the same manner as bleaching agents prepared in another way, viz. :—in the form of baths, in the bleaching kier., &c. According to this invention, the decomposition of the materials which are to furnish the bleaching agent is effected in contact with the fibrous material to be bleached, so as to allow the products of the decomposition to act in the nascent state, whereby the effect is considerably enhanced, and consequently, the quantity of products required for obtaining the required result, or the amount of mechanical power necessary for the electrolytic decomposition, is reduced in a proportional measure. To this end, the fibrous material to be bleached is first impregnated with the solution from which the bleaching agent is to be obtained by electrolysis, and, afterwards, the fibrous material is, in the form of a layer of suitably chosen thickness, carried through between the two electrodes. In consequence of the small distance between the electrodes, but little resistance is opposed to the passage of the electric current, so that a current of low electro motive force will suffice. The positive electrode or anode is made of a material which is not attacked by the evolved bleaching agent, which may be, for instance, chlorine evolved from a solution of a metallic chloride, in which case the said electrode should consist of carbon or platinum. The best shape given to the electrodes is that of revolving cylinders or rollers, which carry along the layer of material and, simultaneously convey the electric current through the same. An advantageous arrangement consists in a succession of several pairs of cylinders or rollers in which the anode is alternately situated above and below, so as to cause the bleaching agent set free by electrolysis to come into contact with the upper and the lower layer of the material alternately. In certain cases, it is found advantageous to pass between the electrodes, together with the material to be bleached, a layer of felt or, simultaneously, to move along two layers of material, either of which is then impregnated with the anion, while the other is impregnated with the cation. In order to prevent the escape of those quantities of chlorine which are not absorbed by the bleaching processes, substances capable of absorbing chlorine are added to the electrolyte; such substances are, by preference, alkalies, such as soda, ammonia, lime, magnesia.

BEET GROWING.

MR. JAMES LONG, in the *Manchester Guardian*, says: Efforts are being made to bring forward the question of sugar production in this country through the medium of the beet. The plan has been tried in the past, but for some generally undefined reason proved a failure. In France, however, this branch of agriculture is a success, and efforts are continually being made to improve the production by experimental work in many directions. A year ago I gave a description of the cultivation of beet, and of sugar manufacture, on the farms owned by the Messrs. Menier, the great chocolate manufacturers, which I had the opportunity of seeing on the occasion of the agricultural trials during the Paris Exhibition. If we may judge by the success that attends their work, sugar making from beet must be a lucrative business, especially to those who are able to utilise it, as the Messrs. Menier do, in a commercial way. The most recent experiments have been made at the station of Capelle, in order to study the increase or diminution of the weights of the roots, of the sugar, and of the leaves during the vegetation of the beet. Results have also been obtained showing the value of particular varieties on account of their early or late ripening and their suitability to different soils. It appears that the formation of the leaves and of the root exercises a considerable influence upon the production of sugar, especially as it is recognised that the beet obtains its sugar through the medium of its leaves. After giving details of the temperature in the different months of the two past years, and of the quantity of rain which fell, the Director, M. Desprez, furnishes the weights of the different portions of the plant on the 22nd of July, when 100 roots from each plot were drawn, and compares the figures with those of the previous year. The result goes in favour of 1889, when the temperature was considerably higher during the period of growth and the rainfall very much less.

	Plot 6.		Plot 7.		Plot 15.
	1889.	1890.	1889.	1890.	1890.
Weight.	Grams.		Grams.		Grams.
Average :					
Of the root	185	102	140	99	112
Of the leaves.....	435	402	360	338	396
Maximum :					
Of the root	340	185	230	150	175
Of the leaves.....	545	480	555	550	580
Minimum :					
Of the root	80	50	60	45	55
Of the leaves.....	210	220	275	220	205
Density of the juice at 59 Fahr. .....deg.	3·9	4·6 ....4·8	5	....4·8	
Percentage of sugar.....7·82		8·92....9·18	9	....8·96	

Difference in favour of 1889.

	Plot 6. Kilogs.	Plot 7. Kilogs.
In beetroot.....	9,130	4,510
In sugar	561	411
In leaves.....	3,635	2,420

KEROSENE OIL IN INDIA.—A striking illustration of the increasing use of kerosene oil as an illuminant among the natives is to be found in the returns of the rail-borne trade of Bengal from the last quarter of the past year. It is there shown that whereas in December, 1887, only 46,000 maunds of oil were transported from Calcutta up country by rail, in the corresponding month last year the amount was no less than 131,000 maunds. The chief obstacle in the way of the extended consumption of oil has hitherto been the difficulty of carriage, as it is an article which cannot be easily conveyed without loss over rough roads and paths into country districts, but the figures given show that these obstacles are being gradually surmounted. Patna has become a great centre of distribution, principally by means of country boats, and similar centres will in time be established elsewhere.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

JOSEPH AIRD, GREATBRIDGE.—Iron tubes and coils of all kinds.

ASHMORE, BENSON, PEASE AND CO., STOCKTON-ON-TEES.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

BLACKMAN VENTILATING CO., LONDON.—Fans, Air Propellers, Ventilating Machinery.

GEO. G. BLACKWELL, LIVERPOOL.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

BRUNNER, MOND AND CO., NORTHWICH.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

BUCKLEY BRICK AND TILE CO., BUCKLEY.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

CHADDERTON IRON WORKS CO., CHADDERTON.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. CLAY, EDINBURGH.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

CLAYTON ANILINE CO., CLAYTON.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. CORTIN, NEWCASTLE-ON-TYNE.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. DAGLISH AND CO., ST. HELENS.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

DAVIS BROS., MANCHESTER.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. DEMPSTER, MANCHESTER.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

DOULTON AND CO., LAMBETH.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. FAHRIG, PLAISTOW, ESSEX.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

GALLOWAYS, LIMITED, MANCHESTER.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

JOHN A. GILBERT AND CO. LTD., LONDON.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

GRIMSHAW BROS., LIMITED, CLAYTON.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

JEWSBURY AND BROWN, MANCHESTER.—Samples of Aerated Waters

JOSEPH KERSHAW AND CO, HOLLINWOOD.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. LINDSEY AND CO., CLAYTON.—Lead Salts, (Acetate, Nitrate etc.) Sulphate of Copper, etc.

CHAS. LOWE AND CO., REDDISH.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

MANCHESTER ANILINE CO., MANCHESTER.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

MELDRUM BROS., MANCHESTER.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. MILNES AND BROTHER, BURY.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

MUSGRAVE AND CO., BELFAST.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

NEWCASTLE CHEMICAL WORKS COMPANY, LIMITED, NEWCASTLE-ON-TYNE.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

ROBINSON, COOKS, AND COMPANY, ST. HELENS.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. ROYLE, MANCHESTER.—Steam Reducing Valves.

A. SMITH, CLAYTON.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

WORTHINGTON PUMPING ENGINE COMPANY, LONDON.—Pumping Machinery. Speciality, their "Duplex" Pump.

JOSEPH WRIGHT AND COMPANY, TIPTON.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

PAPER PULPS.

THE woods that are used in the manufacture of paper are treated in two different ways, one mechanical and the other chemical. In the first, soft woods are especially employed, such as the aspen, poplar, etc., and in the second, the fir, and particularly the silver fir, which furnishes a very pure cellulose.

The mechanical pulp is obtained by abrading, on a horizontal grindstone, billets of wood 12 inches in length, arranged in cells, and held in clamps against the perimeter of the stone. A continuous current of water carries along the pulp formed, which is further refined by another mill before it passes to the lixiviators. Norway, which, as is well known, is widely covered with forests, furnishes Europe with a very large quantity of mechanical wood pulp.

The chemical pulp, which was formerly made by treating wood with caustic soda, is now almost universally obtained by the use of bisulphites, and particularly of bisulphite of lime. The process, which appears to have been first adapted to industrial practice by Dr. Mitscherlich, has received various improvements in Sweden, Austria and France. It gives more economical results than soda, because of the much lower price of the bisulphite of lime.

The wood, which is in general that of the silver fir, is washed and decorticated, and then cut by a circular saw into billets three feet in length, and finally split by a machine. In this state, through the aid of an inclined box, it is presented to a mechanical cutter, composed of a cast steel disc provided with two radial steel blades, and revolving with great rapidity. This machine furnishes 35 cubic feet of wood shavings in the space of six minutes, and these shavings are thrown into baskets, whence they are afterwards taken and spread upon a wide table provided with a grating through which the dust passes. The remains of knots or bark that would not be well adapted for treatment with alkali, are carefully picked out by women. The shavings are then taken to the first story in baskets, and put into the lixiviating apparatus. As the latter presents a few peculiarities because of the extremely corrosive action of the bisulphite of lime, we shall first speak of the manufacture of the bisulphite. This is obtained by the reaction of sulphurous acid produced either by the roasting of pyrites or by the burning of sulphur upon a column of lime stones. The gas traverses this column from bottom to top, and the reaction is facilitated by a showering with water in the opposite direction, and so regulated as to give a lixivium of a proper density.

The bisulphite formed is collected at the base of the column. It is a colourless liquid, of an odour as suffocating as that of sulphurous acid, and attacks all the common metals except lead. So the iron plate lixiviating apparatus have to be provided with a lining of cement, upon which are laid several sheets of lead. Besides, they are inclosed in masonry of refractory bricks, which are themselves covered with lead, and all the openings for the introduction or removal of material are lined with the same metal.

These apparatus, which are of a very large capacity (1,400 to 1,800 cubic feet), are stationary or rotary. A worm made of an alloy of lead and antimony permits of the introduction of steam into the apparatus, in order to raise the bisulphite to a temperature of 130°, but, as the steam might blacken certain parts of the pulp, it is introduced either through a double bottom, or through lead worms with which the sides of the apparatus are provided.

The re-agent removes the gummy and resinous substance, and these are retained in a residuum of sulphate of lime, while the cellulose remains in a practically pure state. In order to free it from the last traces of acid and resinous substances, it is washed with water, without any trouble being taken to collect the residua, which have no value. But the cellulose, which has preserved the appearance of wood, must be reduced to a finer pulp in order that it may be pumped to the purifying apparatus. So, on coming to the lixiviating apparatus it passes into large vats, where it is submitted to the action of an agitator that keeps it constantly in motion. From thence it is forced to the purifiers, which comprise the collectors (long wooden conduits, in which the heavy matters are deposited), and the sifters, which consist of boxes with a moveable bottom provided with apertures that let the good pulp pass, and retain all else.

The pulp is finally drained in conical rotary sieves, and can then be directly employed for many papers, such as those on which journals are printed, coloured papers, etc.

However, it has to be bleached by the mixtures designed for the finer papers. To this effect there is now used a very ingenious process of electro-chemical bleaching, devised by Mr. E. Hermite. It consists in the decomposition of calcium or magnesium chlorides by the passage of an electric current. This forms a liquid possessing a most intense decolourizing power. In the presence of the vegetable fibre, the primitive salt is regenerated in measure as the bleaching proceeds, so that at the end of the operation the same bath can be used again. The sole loss of chloride is what the fibre has taken from the bath. The entire

expense, then, is reduced to that occasioned by the production of the motive power necessary to actuate the dynamos, and the keeping of them in repair.

Finally, we may consider the waste of paper mills, or that of the industries that employ paper as a substitute for rags. Old papers are always sorted before being used. Those containing printed matter are first treated with soda before being refined, and then bleached with chlorine. They are afterwards taken to granite millstones joined in pairs and running vertically over a third and horizontal stone enclosed in a cast-iron vat, into which water is run while the waste is being thrown in. The same operation is applicable to the Norwegian mechanical pulp, in order to render it finer and more homogeneous.

The various pulps that we have just examined, being obtained either in the same mill or purchased outside, have to be mixed according to the qualities that it is desired to obtain. Delicate fibres, like those of cotton rags, yield a thin pulp and flexible and soft paper. Coarse and strong fibres, like those of hemp and flax, furnish a thick pulp and a transparent and smooth paper. Mechanical wood pulp, the fibres of which are very short, adds opacity and body, but quickly becomes yellow. Cellulose, which forms chemical wood pulp, furnishes an excellent paper, silky and soft to the touch and well adapted for printing. Straw pulp has shorter fibres than those of the preceding, but gives transparency and uniformity. Finally, alfa comes nearest to rags, and constitutes the substitute therefore *par excellence*.

The mixture in made in beating engines, which are established in series of three. It is in these apparatus that the paper is sized in order to render it impermeable to ink. The sizing is done with a resinous soap prepared by melting resin with carbonate of soda. The addition of a little alum to the vat precipitates a resinous compound of alumina, which agglutinates the fibres.

A weighting composed of kaolin, plaster, sulphate of baryta, etc., is used for common papers, of which it corrects the transparency and to which it gives whiteness. From 5 to 20 per cent. of fecula is generally added to it, in order to fix it better to the fibres. Finally, the colouring, when pulps formed of coloured rags are not used, which is most generally the case, is done by pouring the colours into the vat through a very fine sieve, or through flannel. The invention of aniline colours, which are all soluble in water, has made this part of the manufacture easy; but these colours are unfortunately sensitive to the action of light.—*Kuhlow.*

CALIFORNIA ASPHALTUM.

ASPHALTUM is mined to a considerable extent in California, but the annual production is quite irregular, being governed by the local demand. When a great deal of iron pipe is being laid, large quantities of the substance are used in coating it. Asphaltum is found in the counties of San Luis Obispo, Santa Clara, Ventura, and Santa Barbara. Between 2,000 and 3,000 tons a year are shipped from the deposits.

The mines of the Ventura Asphalt Co., in the Canyon Diablo, Rancho San Miguelito, have come into prominence since 1888, when they were discovered. The material is found at or near the surface. About 1,800 tons have been so far shipped from this deposit. More or less prospecting work has been done, but now large cuts or tunnels are being run into the deposit. At the point now being worked the elevation above sea level is 1,300 feet, but frequent fossils of shells, sharks' teeth, etc., are found, showing that the mass came up from the ocean.

The vein or bed crops out at many points in the shape of fingers or rounded masses connecting with the main body, the width and length of which are unknown, but upon which breasts of 45 × 16 feet have been worked.

The quality of this asphaltum is unique, possessing as it does great toughness and hardness, and a larger amount of fixed bitumen than other known deposits. The percentage of fixed bitumen is 24·40. It fluxes readily in oils, coal tar, and hydrocarbons, and may be made permanently of the hardness of stone or the pliability of India rubber, according to kind and quantity of flux (solvent) employed and the manner and time of melting, etc.

It has been successfully employed in street paving, and is found not to soften by heat or crack by frost. It is in use for this purpose in several cities in California, Utah, Washington, British Columbia, Mexico, Guatemala, Sandwich Islands, and Australia. For cementing masonry it has been put to use in San Francisco, Santa Barbara County, and other places. The Southern Pacific Co. built a piece of sea wall along the seashore, Ventura County, which was built up of round cobbles cemented together by this asphalt. Two years' trial shows no indications of the wall being injured.

A peculiarity of the Ventura County asphalt is that is is elastic. The Santa Ana Water Co. used it for plastering a reservoir, having first laid up a wall of cobblestones on puddle and then plastering this with hot asphalt. In this open reservoir no change in the material is seen; even in places where the wall settled and cracked, the coating stretched and bent, remaining perfect and sustaining the water pressure. A pile coated with this asphalt was driven at Goat Island without destroying the coating. In doing this, the weight of 3,000 pounds was dropped 22 feet an the pile. The material can be used for coating iron, planks, pipes, etc. Inquiries for the substance from the Eastern States, England, France, Australia, and Central America promise an important shipping business, unless other deposits with such exceptional properties are found.—*Min. and Sci. Press.*

A NEW CHROME MORDANT.

KUR, in the *Chemiker Zeitung*, describes a new chrome mordant which appears to possess some advantages over those now in use. This new mordant is the bisulphite of chromium, made either by passing a current of sulphurous acid gas into water containing freshly precipitated chromium hydroxide in suspension, so that the hydroxide gradually dissolves, or (a better way for producing large quantities) by dissolving chrome alum in twice its weight of boiling water, allowing it to cool to about 15° C., and adding a strong solution of bisulphite of soda until the colour of the liquid changes from a blue green to a yellow green. The cotton is padded in this liquor, allowed to drain, and then either dried or steamed. Steaming is much preferable, as the cloth is left in a moist condition, easily penetrable by the dye liquors which are subsequently used, whereas the dried cloth is only wetted with difficulty. The dyeing is done in the usual manner. The goods may be oiled before mordanting if necessary, and in this particular the new mordant has an advantage over Kœchlin's alkaline-chrome mordant, as the latter removes the oil. In calico printing the new mordant can be used with advantage, and in a variety of ways. It can be applied uniformly by padding, and discharged by printing on oxalic or tartaric acids, finishing as usual, or the chrome mordant itself may be thickened and printed on, the goods being afterwards dyed as usual; or, in the case of the bisulphite compounds of the alizarine colours, the new chrome mordant can be mixed at once with these, the mixture thickened, printed, the cloth steamed and finished as usual. It will be at once seen that this new bisulphite chrome mordant offers some advantages over the older chrome mordants, and it only remains to add that the corresponding alumina and iron bisulphites are equally applicable to show that the dyer and calico printer has here offered to him some really useful novelties.

THE RISE IN SILVER.—The recent enormous rise in the price of silver is giving a great stimulus to silver mining, and the public will do well to examine with great care into the merits of the numerous silver mining companies, the shares of which will probably be offered to them during the next few months, before investing money in them. Many of these companies will, doubtless, be worthless concerns.

THE WESTERN LANGLAAGTE GOLD MINING COMPANY.—The directors' report of the Western Langlaagte Gold Mining Company (Limited) for six months ending June 30th, states, that owing to the late arrival of the permanent pumping and hauling gear, work has had to be suspended on the property for more than three months. The company has shared with other properties the great troubles and drawbacks under which the industry suffered during the close of last and the early part of this year. The revision of the gold law, and recent legislation with regard to titles and railway communication with the sea coast, must have a most beneficial effect in supplying companies with necessaries regularly and promptly, and reducing the working risks and expenses considerably. For these benefits to make themselves felt, it is not necessary to wait until the completion of the railway, which, by the nearest route, may be expected within 2½ years. The mere fact of the railway approaching will (as was the case in Kimberley) work a revolution in the results of the industry here The mine not yet being in a position to mill ore, nothing remains but to write off the expenses incurred during the half year—viz., £3,120.—to profit and loss. The directors are convinced that the work has been well and cheaply done, and will eventually be turned to good account. The estimated cost of the battery, including erection, is £32,200., of which, £5,000. has been paid, leaving a balance to be provided of about £27,200. Before crushing can be commenced, it will be necessary to provide additional accomodation for amalgamators, engine-drivers, &c., and to construct a dam at a total estimated cost of £6,000. For current expenses, erection of pumping and hauling gear, and sinking of main shaft to second level and driving thence to the main reef, a further £3,500. will probably be required. The balance in hand on June 30th, was £4,985., and there are 17,500 reserve shares unissued. The directors are unwilling either to increase the company's working capital at present or to sacrifice the reserve shares in so unfavourable a market, and will take advantage of offers made to them, and borrow in the meantime the money now required.

Correspondence.

ANSWERS TO CORRESPONDENTS.

Sal Vol.—Most of it is exported to South America.
Elektron.—Try "Dynamo Electric Machinery, by S. P. Thompson.'
Dipping.—The articles are immersed for a few minutes in strong nitrate of iron until the desired tint is produced.
Alumino Ferrum (Hamburg).—No doubt. Hundreds besides yourself would be glad of the information. The man who discovers it will have a fortune in his fingers. Diamonds *are* diamonds even yet.
Steel.—The capital was stated as £750,000.
A. J. P.—Send us a sample. Thanks for your hint.
P. S. and Co.—The sample is merely a micaceous sandstone, and has no special value.
J. J. (Ithaca, N. Y.)—Try black oxide of manganese and sulphuric acid.
Ozone.—The article appeared in No. 165 of this journal.
Pro bono publico.—It is more suitable for the daily press.
H.H.A.—(a) We do not know of such a process. (b) Try a manganese salt.
J. McQ.—P. and Co. Gas. Simply advertisements.
R. H. and Co.—Refer to the indices at the Free Reference Library, Manchester.

*** We do not hold ourselves responsible for the opinions expressed by our correspondents.*

MANGANESE ORES.

(To the Editor of the Chemical Trade Journal.)

Sir,—Under the heading of "Trade Notes" in your issue of the 30th ult., I notice a paragraph copied from the *Oil, Paint and Drug Reporter*, where "J. & H., Hamburg," ask some information touching American ores. Evidently, J. & H. know little of this trade, or they would not require to ask such questions through the press.

Having made this article a daily speciality for upwards of 35 years, I have the latest information before me, and if J. & H. will communicate with me direct, I can deal with the matter for them.—Yours truly,

Geo. G. Blackwell,
Liverpool, Sept. 1st., 1890. The oldest Manganese Merchant.

SOLUBLE INDIGO.

A NEW method of rendering indigo soluble, so that it can be used for printing, has been patented. According to the provisional specification this is effected by means of a solution of bisulphite of soda, containing as much zinc as it will dissolve. One pint of this solution is mixed with 1lb. of ground indigo, 3lb. of caustic soda, and more zinc; gum is then added to thicken it. This solution is printed, and the printed fabric being exposed to the air, the indigo becomes oxidised, and the oxidation is completed by alternately passing the fabric through water and air. According to the complete specification, the solution of the indigo is effected somewhat differently; 1lb. of indigo is ground in water, and mixed with 3lb. of caustic soda until all is dissolved, then 1¼lb. of zinc powder are added by degrees; more caustic soda is added, sufficient to keep the mass in solution, when gum is added to thicken. This forms the printing solution, which is used as above. The patentees claim that their process differs from all other methods of printing with indigo, in the fact that they get the indigo in perfect solution before printing, whereas other known methods do not effect this, but print on the indigo in an insoluble form, the indigo having afterwards to be brought into solution on the fibre before it can be properly fixed or developed. We are under the impression, however, that the glucose process, which was introduced some years ago, differed from its predecessors, inasmuch as the fibre was printed with a solution of reduced indigo which only needed oxidation to fully develop the colour.—*Dyer.*

ASBESTOS IN THE LABORATORY.

ASBESTOS in its various forms is a very useful substance, and can be employed very handily in many ways at the lecture-table and in the laboratory, says Professor Markoe. Shredded or carded asbestos will serve as an excellent filtering material, used just the same as paper pulp. Asbestos twine for use in binding together parts of apparatus exposed to fire or strong acids. The writer often prevented a crack in the neck of a retort or flask from spreading by binding it with asbestos yarn or twine soaked in solution of sodium silicate, and then treated with a solution of calcium chloride, a perfectly insoluble cement being thus formed. Asbestos wool mixed with solution of silicate of sodium makes a fire-proof cement of great strength, also serves to mend cracks in stoneware; can be made insoluble by subsequent treatment with calcium chloride, silicate of calcium being formed. Asbestos paper and card can be obtained of all degrees of thickness, and can be well employed as substitutes for wire gauze and the sand-bath in small operations involving the heating of glass vessels. Asbestos paper and silicate of sodium is very useful for mending cracks in glass apparatus.

BACK NUMBERS OF THE CHEMICAL TRADE JOURNAL.

NOTICE.

AS we shall shortly clear out our stock of odd numbers of the earlier volumes of the Journal, those of our readers who require back numbers, to complete their sets, should apply for the same not later than October 4th. Some of the numbers are out of print.

Trade Notes.

A Useful Cement.—For the cementing of iron railing tops, iron gratings to stoves, etc., the following mixture is recommended; in fact, with such effect has it been used as to resist the blows of a sledge hammer. This mixture is composed of equal parts of sulphur and white lead, with about one-sixth proportion of borax, the three being thoroughly incorporated together, so as to form one homogeneous mass. When the application is to be made of this composition, it is wet with strong sulphuric acid, and a thin layer of it is placed between the two pieces of iron, these being at once pressed together. In five days it will be perfectly dry, all traces of the cement having vanished, and the work having every appearance of welding.

The Utilisation of Waste Coal.—The utilisation of the enormous banks of culm, or waste coal, in the Pennsylvania anthracite region, which is now the subject of examination by a State commission, has been taken up in a very practical way by the Lehigh Valley Coal Company. At its Exeter colliery, at Pittston, it has just completed, arrangements to wash the immense culm banks which surround the breaker with water. The method used is a very simple one, although it is something new. Tons of the coal dirt are dumped into a screen, which revolves in a large tank of water. The fine dust is thus forced out, while the sizes of small coal of commercial value are retained. The expenses of washing are comparatively slight, and the company will make a handsome profit from what a short time ago was considered worthless stuff.—*Bulletin.*

Electrolytic Bleaching.—The patent of Carl Kellner, of Vienna, for process and apparatus for bleaching vegetable fibres, refers to electrolytic methods, and is said to be based upon the discovery that colouring substances adhering to the fibre are far more easily and rapidly converted into compounds soluble in water, by alternately treating the fibrous material to be bleached with chlorine or compounds containing active chlorine and alkalies. It is assumed by the inventor that the ultimate action of chlorine is to change the insoluble colouring matter into a soluble one, but before that stage is arrived at, the chlorine has converted the colouring matter into a substance which, though not soluble in water, is soluble in alkalies, and it is economical, both as regards material and time, to alternate the treatments of chlorine and alkali. Further, the process in general use is said to produce hydrochloric acid, and it is neeessary to prolong the action of the chlorine until compounds, soluble in acids, are formed, which, it would appear, requires a further action of chlorine than is required to make compounds soluble in water. It is hardly worth enquiring whether the inventor's hypothesis on bleaching in general is well founded or not. In textiles the alternating treatment with alkali and chlorine is very old, but this patent appears to refer only to bleaching matter in the shape of pulp.—*Kuhlow.*

British and Foreign Spirits.—It appears from the minutes of evidence recently taken before the Select Committee of the House of Commons on the production and sale of British and foreign spirits, that the quantity of spirits at proof made in the United Kingdom in the year ending March 31 last amounted to 40,900,000 gallons. Of that quantity 28,000,000 gallons went into consumption, 3,500,000 were exported, and 2,500,000 gallons evaporated in bond. The amount used for methylation was 1,500,000 gallons, and for medicinal purposes and tinctures 1,000,000 gallons. The actual quantity of spirits consumed in England was 16,853,723 gallons, in Scotland 6,263,878 gallons, and in Ireland 4,710,683 gallons. This gave half a gallon per head of population in England, a little over one-and-a-half gallons per head in Scotland, and a gallon per head in Ireland The figures of illicit distillation for the last financial year were 11 for England, 31 for Scotland, and 1,739 for Ireland. The gallons of whisky in bond in the year ending March 31, 1886, were, in round numbers, 68 millions; in 1887, 72 millions; in 1888, 76½ millions; and in 1889, upwards of 85 millions. Foreign markets and the places to which exported spirits go have been changing lately. For example, the production in Australia is increasing, and British exportation to the Antipodes is declining. The use of methylated spirit is increasing rapidly. In 1885-86 it was 2,447,798 gallons, while in 1888-89 the returns were 3,188,306 gallons.

Bankruptcy of a Manchester Chemical Merchant.—A bankruptcy petition was yesterday presented in the Manchester County Court against Mr. John Nicol (trading as Nicol and Co.), of Fountain-street, Manchester, and residing at 15, Cresswell-grove, Albert Park, Didsbury, chemical, metal, and mineral merchant and agent.

To Distinguish Wood Pulp Paper from Pure Cellulose Paper.—Since the latter does not contain foreign aromatic bodies capable of giving in the presence of an acid, colour reactions with the phenols and other analogous substances, while these are always present in wood pulp paper, Wurster purposes to employ the phenols as re-agents for this purpose. Thus orcin gives with wood paper a deep red colour, and phloroglucin a violet blue reaction in the presence of acids. Pure cellulose paper is unacted upon under similar conditions.

The "Chance" Sulphur Process.—From Newcastle-on-Tyne the first shipment has just been made of sulphur produced by the Chan e process at the new works of the Newcastle Chemical Works Company. The production of this sulphur from tank waste is a most interesting chemical discovery; and whilst it has been applied at several establishments, it is asserted that at none is there the same detailed application or the same large scale of manufacture as at the works at Gateshead.

The Chemical and Copper Workers' Demonstration.—The demonstration of the St. Helens and Widnes chemical and copper workers, which was arranged to take place last Saturday at Southport, has been postponed till to-day. Excursion tickets are being issued and every arrangement is being made to make the demonstration a success. Mr. John Burns, as has already been stated, has consented to attend and address a meeting to be held in the Winter Gardens. Councillor J. P. Mearns has also consented to attend. The following gentlemen are expected to be present: Mr. Henry Broadhurst, M.P., Mr. G. C. Chamberlain, M.P., Mr. George Howell, M.P., Dr. Bellew, etc. Special arrangements have been made for the excursionists to visit the Aquarium, the Winter Gardens, and an afternoon performance at the circus.

Lead in Lace.—Ph. De Clarmont gives the following remarkable account, in *Le Moniteur de la Teinture*, of a white satin dress totally ruined by its trimming with English lace. The dress had been worn but once, had then been packed into a trunk which was deposited in a damp place and exposed to emanations of hydrosulphuric acid from gas. When taken out, it was found that the pattern of the lace, particularly of its tulle ground, had been printed in indelible black upon the white satin. The accident was not difficult to explain. English lace is habitually charged with sulphate of lead, which in this case had absorbed hydrogen and hydrosulphuric acid from the atmosphere, forming sulphide of lead, which had been imprinted and fixed upon the white satin, which naturally had also absorbed hydrogen and hydrosulphuric acid. The seller of the lace showed that charging English lace with white lead (sulphate of lead) was commercial usage, and thereby escaped paying the damage. An objectionable usage it is at any rate, as the absorption of lead through the skin from such lace may become dangerous to health.

Gas Companies.—At the half-yearly meeting of the Wolverhampton Gas Company the report of the directors for the past six months stated that there was a net profit of £4,106., which, added to the balance of last account, amounted to £6,926. From this the directors recommended the declaration of the usual dividends of 5 per cent. upon the consolidated stock and 3 per cent. upon the preference shares, leaving a balance of £654. to carry forward. The report was adopted, and the dividends as recommended declared.—The directors' report of the Crystal Palace District Gas Company for the half-year ended June 30, 1890, states that the result of the half-year's working shows a balance to the credit of revenue account of £7,431. The decrease in the profit of the half-year's working, as compared with the corresponding half of last year, is due to increased wages paid to the whole of the workmen, to large advances in the cost of coal and materials connected with the manufacture and distribution of gas, also to the reduction made in the price of gas to 2s. 6d. per 1,000 cubic feet, from Michaelmas quarter, 1889. Coke and other residuals show an improvement of £2,036., and there has been an increase of 2·41 per cent. in the quantity of gas sold over the corresponding period of 1889. The directors recommend the declaration of a dividend for the half-year ended June 30 last at the following rates per annum:—Six per cent. on the preference stock; 7 per cent. on the ordinary 7 per cent. stock; 10 per cent. on the ordinary 10 per cent. stock; and 7 per cent. on the new ordinary 7 per cent. shares—amounting to £13,626., less income-tax.—The report of the Bristol United Gas Light Company states that, notwithstanding the continued high price of coals and other materials, the advance in wages, and the increased cost of the higher illuminating power of the gas now supplied by the company above the requirements of their Act of Parliament, they are able, after providing for the *maximum* dividend of £10. per cent. allowed by the Act, to carry forward a balance of £1,266. 2s. 2d. to the credit of the next half-year's account. Resolutions will be submitted at the meeting reducing the number of directors for the future from eight to seven, and also for increasing the fees of the auditors and the remuneration of the directors.

SLAG CEMENT.

In a recent article on slag cements, *Le Genie Civil* states these cements are made by finely grinding blast furnace slag, and mixing it with a suitable proportion of fat lime. The grinding has to be very fine, because, as the cement is made by a simple mixture, it is necessary that the surface on which the two constituents, the lime and slag, react on each other should be as large as possible, if proper chemical combination is to ensue. As manufactured in France, the cement leaves only 20 per cent. on a sieve containing 25,000 meshes per square inch, and only 8 to 10 per cent. on a sieve with 4,500 meshes per square inch. The density of slag cements is much less than that of Portland, weighing, bulk for bulk, but from 0·8 to 0·88 times as much. In general, this cement also sets somewhat more slowly than Portland, but when hardened has, in many cases, a greater strength, particularly at early dates after setting. In some experiments still unfinished, the following results were attained with a slag cement from the Department of Isere:—

Age.....	1 week.	1 month.	3 months.
Breaking load, lb. per square inch.	473·5	568.8	678·3

These figures are higher than any attained in tests made on Portland cements for the new Croton aqueduct. Experiments have also been made with slag cement morter mixed with, and allowed to harden in, sea water, and gave the following rerults; the morter consisted of six parts by weight of cement to 10 of sand:—

Age	Breaking weight, lb. per square inch.				
8 days.....	252·0	319·9	275·1	273·0	285·8
28 ,, ...	375·4	327·0	327·0	248·4	341·2

The main objection to slag cement seems to be that if it is allowed to harden in dry air, its strength is very materially reduced, and it is then liable to crack. In the town of Villefranche-sur-Saone (Rhone) it has been largely used for paving footpaths, some 4,800 square yards having been laid there with the most satisfactory results.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

Prices in the alkali trade continue steady and there is good demand for all the products. Caustic soda has been exceedingly brisk and quotations are a shade higher than for the previous week. The nearest values to-day are for 74%, £11. 15s.; 70%, £10. 15s.; 60%, £9. 15s. f.o.b. Liverpool, and 77% £12. f.o.b. Tyne. Soda ash is selling steadily at 1¼d. to 1⅛d. per deg. according to brand. The demand is still brisk for soda crystals, and stocks being low, prices are firm at £3. 5s. to £3. 10s. at works. Bleaching powder in steady demand at £5. 7s. 6d. per ton on rails, and £5. 15s. f.o.b. Some sales still continue to be made at £6. for delivery over 1891. Chlorate of potash firm at 5d. Soda advanced to 6½d. Acetates of lead continue dull, and there is but a small amount of business passing. We quote foreign white £24. c.i.f.; brown, £18. 15s. c.i.f.; English white, £28. Litharge rather firmer but price unchanged. Sulphate of copper is in somewhat better request for future delivery, but prices do not improve. Spot price about £18. to £18. 10s. Ammonia and its salts quiet at former prices. Sulphocyanides of ammonium and barium keep in fair demand, values unchanged. Chromic acid sells freely at 6¼d per lb. Sulphate of manganese somewhat scarce at £16. 10s. to £17. per ton. Carbolic acids without change.

THE COPPER MARKET.

Messrs. Harrington and Co.'s copper report, dated Liverpool, 2nd September, 1890, states:—

Chili copper charters for second half of August are advised as 1,100 tons fine. The total charters since 1st January have been 16,700 tons against 15,400 tons for same time last year. There has been a further rise in the price of G.M.B. copper since our last issue, with good business done at prices ranging from £59. 2s. 6d. to £60. 5s. for cash, and £59. 10s. to £60. 15s. for forward. Market closing to-day at £60. and £60. 7s. 6d. respectively. The total decrease for the fortnight in the Liverpool, Swansea, London and Havre stocks is 885 tons. The present stock of English G.M.B.s' in warehouse, Liverpool and Swansea, is 4,013 tons, against 4,398 tons on 15th ult., showing a decrease of 385 tons. Refined and manufactured sorts are firm. Official quotations are—English tough, £63. to £64.; best selected, £66. 10s. to £67. 10s.; India sheets, £67. to £68.; strong sheets, £72.; and yellow metal sheets were officially raised on the 29th ult. to 6½d. per lb. There are rumours of a fire or bad explosion of gas in the Anaconada Mine, and it is almost certain that there will not be any ordinary matte sent forward this year from the mine. There has been a good demand for furnace material, and the following sales have taken place: 690 tons Mason's precipitate at 11s. 3d. to 11s. 7½d.; 180 tons English precipitate at 12s. 3d. to 12s. 4½d. and 50 tons.

55 to 60 per cent., at 12s. 1½d. ; 170 tons Italian ore at 10s. 6d. ; 600 tons ordinary Anaconda matte, old stock at 12s. ; 650 tons argentiferous Anaconda matte, for immediate and forward delivery, on private terms ; 122 tons Chili regulus, out of old stock, at 12s. ; 100 tons Seville ore, 5 to 6 per cent. copper, and 40 to 45 per cent. sulphur, at 10s. 6d. ; 100 tons Cueva de la Mora precipitate, out of old stock, at 11s. 10½d. ; 600 tons Boston Montana matte, to arrive here, on private terms ; 1,700 tons Boleo matte at 12s. per unit ; and 660 tons Boleo bars on private terms, to arrive, and be delivered Swansea and Liverpool in equal quantities.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron opened flat. Scotch warrants closing at 49s. 2½d. cash, and 49s. 5d. one month. Settlement prices:—Scotch, 49s 2d.; Middlesbrough, 45s. 9d.; hematite, 56s. 2d. Copper easier at £59. 12s. 6d. to £59. 17s. 6d. cash, and £60. 2s. 6d. three months, closing at £59. 17s. 6d. buyers, three months. Tin, dearer: Straits closed at £97. 15s. to £98. 5s. cash, and £98. 10s. to £99. three months ; Australian, £98. 10s. to £98. 15s. cash. Lead firm : Spanish, £13. 5s.; English £13. 7s. 6d. to £13. 10s. Spelter, Silesian ordinary, £24. 5s. Quicksilver, £10. 10s. first hands, £10. 7s. second. In copper shares, Rio Tinto rose $\frac{1}{16}$ to $25\frac{1}{16}$, and Mason and Barry, Cape, and Tharsis, $\frac{1}{16}$ each to $8\frac{9}{16}$, $5\frac{1}{16}$, and 6.

GLASGOW, Wednesday.—The pig-iron market opened flat. Fair business was done at 49s. 3d., 49s. 4d., 49s. 2d., to 49s. 0½d. cash, and 49s. 3½d., 49s. 1½d., 49s. 4½d., to 49s. 3d. one month ; buyers at 41s. cash, sellers 1d. more. Middlesbrough warrants were done at 45s. 10d. cash, and 45s. 10½d. one month ; buyers 45s. 8½d. cash, sellers 45s. 9½d. Hematite warrants done at 56s. 9d. cash, and 56s. 10½d., 56s. 9d., to 56s. 10d. one month ; buyers 56s. 7½d. cash, sellers 56s. 8d. In the afternoon the market was steady, good business being done at 48s. 11d., 48s. 9½d., to 49s. 2d. cash, and 48s. 1½d., 49s. 11½d., to 49s. 4d. one month ; buyers 49s. 2d. cash, sellers ½d. more. Middlesbrough warrants done at 45s. 7½d. ten days ; buyers 45s. 9d. cash, sellers 46s. Hematite warrants done at 56s. 2d. cash, 56s. 6½d., 56s. 3d., to 56s. 4½d. one month ; buyers 56s. 2d. cash, sellers 56s. 3d.

WOLVERHAMPTON, Wednesday.—The autumn export demand is opening up well in Staffordshire, and a confident tone pervaded business on 'Change this afternoon. The revival of shipbuilding on the Clyde, and the heavy requirements for permanent way material and rolling stock by the chief railways are considered to be satisfactory features of the trade outlook. Sheets are in better demand at £7. 5s. to £7. 10s. for singles ; marked bars, £8. 10s.; hoops, £7. 10s.; best stamping sheets, £12.; Derbyshire pigs, 53s.

TAR AND AMMONIA PRODUCTS.

Benzol is quieter, prices, however, are steady at 4s. 3d. for 90s. and 3s. 3d. for 50/90s. Anthracene continues to be in good demand, and prices are again higher. Business has been done in 30% A at 1s. 5d., and in 30% B at 1s. 2d. One shilling and sixpence and 1s. 3d is now asked. There is a good demand for solvent naphtha, and prices are being well maintained. Creosote is also moving off freely at the current prices of last week.

There is very little to report in the sulphate of ammonia market, which maintains a firm tone. Quotations remain at £11. 13s. 9d. to £11. 15s., f.o.b., Hull and Liverpool, and £11. 12s. 6d., f.o.b., Leith, and even higher at this latter port. Speculators who are compelled to buy to cover sales for this month's deliveries, are reporting the market easier, but with so little offering the chances of a good demand, makers are not likely to be influenced by these manœuvres. Nitrate of soda is firm at 8s. 6d.

REPORT ON MANURE MATERIAL.

The quieter market to which we referred in our last report has continued through the past week. Buyers being still unwilling to follow the advance in prices demanded by sellers.

For hot-air dried Bull River phosphate rock 11d. per unit would have to be paid, for cargoes c.i.f. to U.K., and 10d. per unit for land rock. Somme and Belgian phosphates are offering more freely, but without alteration in prices. For Canadian 70% rock 12¼d., ¼ rise, full delivered terms, would still be business, but the higher grades are scarcer, and relatively higher prices required.

We do not hear of any further business in River Plate cargoes of bones ; buyers not seeing their way to paying the 2s. 6d. per ton advance required. There are still buyers at £5. 10s., but sellers now want £5. 12s. 6d. Further sales of good Brazil bones have been made at £5. 5s. and £5. 7s. 6d., ex-quay Liverpool. Fifty tons crushed Calcutta bones sold at £5. 11s. 3d., ex-quay Liverpool, June shipment, but this price would not do for shipment ahead. Sales of Bombay bone meal on spot have been made, ex-store Liverpool, at £5. 15s., and this price refused for shipment.

The market for nitrate soda is very firm, 8s. 6d. paid for a small due cargo, but 8s. 4½d. may be quoted as nearest value for large cargoes in the same position. September-October shipments, ordinary quality, are worth fully 8s. 9d. per cwt., and for refined 9s. would have to be paid. Spot is worth 8s. 4½d., ordinary, and 8s. 6d. to 8s. 7½d., refined.

Dried blood without change. Home prepared is worth about 10s. 6d. per unit, but there is not much disposition to buy it at the price. Ground hoof has been sold at 9s. per unit, f.o.b., but it is doubtful whether the purchase could be repeated.

Superphosphate very firm, but without change in price. Kainit is worth about 31s per ton, in cargoes, in bulk, c.i.f., for early shipment ; for November-December, 32s. 6d. would probably have to be paid.

THE LIVERPOOL MINERAL MARKET.

Our market has ruled steady during the week. Manganese : Arrivals have not been up to the mark, but prices remain unaltered. Magnesite : On account of very heavy stocks prices are totally in the hands of buyers ; raw ground, £6. 10s., and calcined ground, £11. Bauxite (Irish Hill brand) : The demand is above the production, and prices are very firm ; Lump, 20s. ; seconds, 16s. ; thirds, 12s. ; ground, 35s. Dolomite, 7s. 6d. per ton at the mine. French Chalk : Arrivals continue small, and on account of increased demand prices have risen considerably, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes (carbonate) : The production has increased, prices, therefore, somewhat easier ; selected crystal lump scarce at £6. ; No. 1 lumps, 90s. ; best, 80s. ; seconds and good nuts, 70s. ; smalls, 50s. ; best ground, £6. ; selected crystal ground, £8. Sulphate : The production of best white has decreased; making prices firmer ; best lump, 35s. 6d. ; good medium, 30s. ; medium, 25s. 6d. to 27s. 6d. ; common, 18s. 6d. to 20s. ; ground best white, G.G.B. brand, 65s. ; common, 45s. ; grey, 32s. 6d. to 40s. Pumicestone continues steady; ground at £10., and specially selected lump, finest quality, £13. Iron ore easier. Bilbao and Santander, 9s. to 10s. 6d. f.o.b. ; Irish, 11s. to 12s. 6d. ; Cumberland, 9s. to 10s. 6d. Purple ore without alteration. Spanish manganiferous ore in fair demand. Emerystone : Best brands continue to be asked for at full figures. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth steady ; 45s. to 50s. for best blue and yellow ; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal in fair request, without any alteration in prices. Chrome metal, 5s. 6d. per lb. Chrome ore : Prices rather stronger. Antimony ore and metal in strong demand at high prices. Asbestos continues in strong demand, especially rock, and prices very firm. Potter's lead ore of best and standard brands in request ; powdered, £15. 10s. ; smalls, £14. to £15. ; selected lump, £16. to £17. Calamine : Best qualities scarce, 60s. to 80s. Strontia steady ; sulphate (celestine), 16s. 6d. to 17s. Carbonate (native), £15. to £16. ; powdered (manufactured), £11. to £12. Limespar : English manufactured, old G.G.B. brand in demand, and brings full prices ; 50s. for ground English. Felspar, 40s. to 50s. ; fluorspar, 20s. to £6. Plumbago steady ; Spanish, £6. ; best Ceylon lump at last quotations ; Italian and Bohemian, £4. to £12. per ton ; founders, £5. to £6. ; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ferro-manganese and silicon spiegel steady. Chrome iron unaltered at last quotations. Ground mica, £50. China clay is firm—common, 18s. 6d. ; good medium, 22s. 6d. to 25s. ; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), finest quality, 20s. to 22s.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Bleaching powder is on the fall again, a circumstance to which is attached more than usual significance just now ; but with this exception the market is rather a hardening one. Caustic soda is scarce and in demand, and, consequently, there has been a further considerable rise, the 60/62° cream gaining 10s., and the middle sorts about 7s. 6d. each. Sulphate of copper, which has long been dropping from the summit of £27. in February last, touching £17. 15s. a week ago, at

last shows signs of having bottomed for the time, marking the event by a slight recovery which is more than likely to be followed up. Chlorate of potash is in request, and at the moment dearer than at any time for nearly twelve months. Sulphate of ammonia is not now wanted in such quantities for Glasgow shipment; but stocks are drained, and the Leith parcels going are dearer, say a firm £11. 12s. 6d. for prompt. In the paraffin section, the situation is unchanged, except to this extent, that burning oil contracts for the winter being about completed booking has almost ceased. The others continue firm. Bichromate of potash, at reduction, is being pretty plentifully called for; bichromate of soda also is in fair demand, though not up to the other. Chief prices current are :—Soda crystals, 55s. 6d. net Tyne; alum in lump £5. less 2½%, Glasgow; soda ash, 1⅜d. less 7½%, Tyne; caustic soda, white, 76°, £12., 70/72°, £10. 12s. 6d., 60/62°, £9. 12s. 6d. and cream, 60/62°, £9. all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s, and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1⅜d., less 2½% Tyne; saltcake, 32s. 6d.; borax, English refined, £30., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 2s. 6d. to £5. 7s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 7½ and 10% to Scotch and English buyers respectively, delivered (export orders, a farthing less, and 7% off f.o.b. Glasgow); chlorate of potash, 5⅛d., less 5% any port; nitrate of soda 8s. 4½d. to 8s. 6d.; sulphate of ammonia, f.o.b. Leith, prompt, £11. 12s. 6d.; Glasgow shipment, about the same; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18. less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3⅝d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less). ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 10,923 bags.

THE LIVERPOOL COLOUR MARKET.

Colours continue very steady. Ochres: Oxfordshire has been quoted at £10, £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, cargoes to arrive, 40s. to 50s.; Devonshire, 50s. to 55s. White lead, £21. 10s., to £22. Red lead, £18. Oxide of zinc, V.M. No. 1, £25.; V.M., No. 2, £23. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Terra Alba: Finest white, 60s.; good, 40s. to 50s. Rouge: Best, £24.; ditto for jewellers', 9d. per lb. Drop black, 25s. to 28s. 6d. Oxide of iron, prime quality, £10. to £15. Paris white, 60s. Emerald green, 10d. per lb. Derbyshire red, 60s. Vermillionette, 5d. to 7d. per lb.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There is little change to report in chemicals this week, prices have been steadily maintained, and the feeling all round is one of firmess. Bleaching powder, after dropping as low as £5. per ton, has advanced to £5. 2s. 6d. to £5. 5. per ton. Caustic Soda is in good demand, and spot prices are quoted for deliveries to end of the year. Crystals, Soda Ash, and Sulphate continue steady at last week's quotations.

For prompt shipment makers quote :—Bleaching powder, in soft-wood casks, £5. 2s. 6d. to £5. 5. per ton; hardwood casks, 5s. per ton extra; caustic soda, 77%, £11. per ton; ground and packed in 3-4 cwt. barrels, £14. per ton; soda ash, 48/52%, 1¾d. per degree less 5% to 7%; soda crystals, 55s. 6d. to 56s. per ton; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 41s. per ton; recovered sulphur, rock, in 2 cwt bags, £4. 3s. 6d. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

Manufacturing coals are in good demand and firm in price. Northumberland steam small quoted 7s. to 7s. 6d. per ton, and Durham small 8s. to 8s. 6d. per ton.

The bleaching powder and chlorate of potash plant of the Tyne Alkali Co. Ld., South Shields, is announced for sale by auction on Tuesday next. The plant has been standing idle for some years. It is said that the Harton Coal Co. have purchased the site for the purpose of extending their patent fuel works.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

J. Coleman and J. H. Dunn, under the style of Coleman and Co., Whitechapel-road, E., chemists and druggists.
B. J. Duggan and J. E. Parry, under the style of B. J. Duggan and Co., Manchester, oil merchants, refiners, and importers.
J. C. Templer and T. Ellis, under the style of J. C. Templer and Co., Blackley, near Manchester, tanners and leather dressers.
Towlson and Weldon, New Basford, dyers and bleachers.
Halliday and Sharp, Halifax, brewers.

New Companies.

Ceres Ironworks, Limited.—This company was registered on the 22nd inst., with a capital of £15,000., in £10. shares, to carry on the business of general and mechanical engineers, metal founders, and implement makers, etc. The first subscribers are:—

	Shares.
B. Howell, Cwmbrae, Long Ditton	1
J. B. Williams, Glenthorne-villa, Chelmsford-road East, South Woodford, clerk	1
J. Malley, 23, Delancey-street, Regent's-park, N.W, clerk	1
J. T. Bullock, Campsbourne-road, Hornsey, N.	1
W. H. Nuttall, Thames-street, Kingston-on-Thames	1
T. Stevens, Ceres Ironworks, Kingston-on-Thames	1
W. P. Fuller, 2, Verulam-buildings, Gray's-inn, W.C.	1

Harmonious Colouring Company, Limited.—This company was registered on the 23rd inst., with a capital of £4,000., in £5. shares, to carry on the business of manufacturers or mixtures of colours or coloured materials, and to carry into effect an agreement made 22nd July between Chas. Hy. Wilkinson of the one part and Hy. Bernonlli of the other part in relation to his invention for an improved system of harmonious colouring. The subscribers are :—

	Shares.
H. B. Barlow, 17, St. Ann-square, Manchester, patent agent	80
J. Gill, Piccadilly, Manchester, manufacturing chemist	40
R. Hay Brown, jun., Old Trafford, Manchester	20
R. Hollingdrake, Heaton-lane, Stockport, ironfounder	20
A. Muir, Manchester, engineer	20
G. Comber, Warrington, merchant	20
J. E. Heppenstall, Milnbridge, manufacturer	20

Hull Fish Manure and Oil Company, Limited.—This company was registered on the 23rd inst., with a capital of £10,000., in £10. shares, to manufacture and deal in manure and oil, whether wholly or in part composed of or extracted from fish or fish refuse, or any other similar or suitable material or otherwise. The subscribers are :—

	Shares.
L. Spring, Hull, fish merchant	1
A. Spring, Hull, fish merchant	1
C. Pickering, Hull, fish merchant	1
R. Harding, Hull, fish curer	1
T. H. Homer, Hull, fish merchant	1
J. Needler, Hull, fish merchant	1
J. A. Smith, Hull, fish merchant	1
G. T. Tether, Hull, fish merchant	1
G. Rowntree, Hull, fish merchant	1

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Drying Apparatus. Henry Harrison and Harrison Brothers. 12,908. Aug. 18
Treatment of Town Refuse. Alfred Charles Wilson and Andrew Ford 12,910. August 18.
Apparatus for Making Steel. George Roger. 12,912. August 18.
Improved Beer Compound Walter Thomas Thorp. 12,932. August 18.
Coating Wires with Heavy Metals and Alloys. Sherard Osborn Cowper-Coles. 12,938. August 18.
Bleaching. Heinrich Spreckley. 12,950. August 18.
Steam Boiler Furnaces. Adam Cyrus Emgert. 12,953. August 18.
Lead Pellets or Shot. Edward Palliser and Charles Ambrose. McEvoy. 12,956. August 18.
Nitroso Colouring Matters. Benjamin Willcock. 12,962. August 18.
Steam Boiler Feed Water Regulators. Charles William Julius Nolte. 12,965. August 18.
Thermoelectric Generators. Harry Barringer Cox. 12,979. August 19.
Steam Traps. Matthew Dunlop. 12,980. August 19.
Smoke Consumption Carl Strauss 12,991. August 19.
Manufacture of Oxyphthalic Acids. James Yate Johnson. 12,993. Aug. 19.
Induction Coils for Electric Welding. Henry Harris Lake. 13,002. Aug. 19.
Electrodes for Primary or Secondary Batteries. David Pepper. 13,003. August 19.
Electric Welding. Henry Harris Lake. 13,006. August 19.
Colouring Matters. Wilhelm Majert. 13,010. August 19.
Electrodes for Primary and Secondary Batteries. David Pepper. 13,013. August 19.
Heating and Purifying Water. Henry Harris Lake. 13,017. August 19.
Electrolysis of Melted Haloid Salts. Gustat Otto Rennerfelt. 13,024. August 19.
Filters and Filtering Apparatus. Reginald William James. 13,029. Aug. 19.
Artificial Fuel. Frederick Lennard and Edward William Harding. 13,033. August 19.
Moistening Air. Albert Schmid and Albert Koechlin. 13,042. August 19.
Dyeing Apparatus. Sydney Pitt. 13,048. August 19.
Manhole Doors Charles Joseph Howe. 13,074. August 20.
Brickmaking Machinery. Thomas Constantine Fawcett. 13,078. August 20.
Pyrometers William Dutton. 13,084. August 20.

Preserving Organic Substances. Chas. Léon Bachelerie. 13,089. August 20.
Compound for Making Joints. Max Blumrich. 13,112. August 20.
Electricity Meters for Electric Currents. George Hookham. 13,123. Aug. 21.
Valves for Corrosive Fluids. Thomas Young. 13,127. August 21.
Drawing off Liquids from Closed Vessels without admitting Air to contact with Liquid inside. Edward May Munro. 13,131. August 21.
Manufacture of Bricks, Pipes, &c. Charles Denton Abel. 13,134. Aug. 21.
Production of Aluminium Chloride and Aluminium. George William Clark, John Clark, and Walter George Dixon. 13 137. August 21.
Liquid Meters. Joseph John Taylor. 13,140. August 21.
Firing Pottery. Louis Hartmann Jahn. 13,155. August 20.
Mono and Disulpho Acids of Tetramethyldiamidodiphenylmethan. John Rudolph Geigy. 13,165. August 21.
Air-tight Cover for Cisterns. Julian Garner and Edward Craddock. 13,166. August 21.
Machine for Forcing Water or Air. Fredk. Wm. Cleveland. 13,168. August 21.
Apparatus for Dyeing Yarn. Ira Franklin Peck. 13,184. August 21.
Steam Generators and Gas Coolers. Wm. Froggatt and Geo. Dawson. 13,186. August 21.
Electromotors. Ross Franklin Moore. 13,187. August 21.
Double Wedge Bricks and Tiles. Friedrich Wilhelm Glückselig. 13,204. August 22.
Moistening Air. Henry Mercer Girdwood. 13,208. August 22.
Electric Accumulators. Robt. Drysdale. 13,212. August 22.
Transport Casts for Slag. Constant Bochkoltz. 13,214. August 22.
Enamelling Kilns for Earthenware. Samuel Sambrook. 13,222. August 22.
Manufacture of Cement. Christen Rees Bonné. 13,227. August 22.
Bottle Filling Apparatus. Wm. Lloyd Wise. 13,231. August 22.
Portable Electric Lamps. The Mining and General Electric Lamp Co., Ltd, and William Moscrop. 13,233. August 22.
Inducing Currents of Air. James Henry Pickup, James Byrom, and Edwin Dransfield. 13,234. August 22.
Production of Azo Dyes. Benjamin Willcox. 13,235. August 22.
Manufacture of Phosphorus and Alkaline Silicates. Louis Marie Charles Folie-Desjardins. 13,240. August 22.
Charging Bottles with Aerated Liquid and Gas. Wm. Aubert. 13,241. August 22.
Feed-Water Purifiers. Edward Franklin Peacock and Harry Clifton Regan. 13,253. August 22.
Apparatus for the Extraction of Gold. Claude Theodore James Vautin. 13,259. August 22.
Funnels. Joseph Lyte. 13,264. August 23.
Rolling and Flattening Sheets and delivering the same to Rolls in Galvanising Baths. Graham Corry. 13,278. August 23.
Construction of Drain Pipes. Enos Hindle. 13,279. August 23.
Pottery Kilns. Jesse Kirkman. 13,282. August 23.
Evaporating Apparatus. James Foster. 13,284. August 23.
Devulcanising India-rubber. Alfred Francis Bilderbeck-Gomess. 13,294 August 23.
Bogies for Receiving and Conveying Furnace Slag. Charles Lowthian Bell. 13,309. August 23.
Manufacture of Sulphide of Sodium. Francis Ellershausen. 13,312 August 23.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Aug. 23rd.

Alkali—
Holland, 400 c. R. W. Greef & Co.

Antimony Ore—
Sydney, 7 t. L. & I. D. Jt. Co.
Portugal, 10 ,,
Singapore, 50 Pillow, Jones, & Co.
Melbourne, 95 S. Boor & Co.
Japan, 54 c. Howards & Sons

Alum—
Holland, £45. Ohlenschlager Bros.

Acetate of Lime—
U. S., 361 pks. Johnson & Hooper

Acetic Acid—
Holland, 5 pks. A. & M. Zimmermann
,, 80 Beresford & Co.

Bones—
U. S., 7 t. Brown & Elmslie
E. Indies, 6 Gonne, Croft, & Co.

Boracic Acid—
Italy, 20 pks. W. Nicholson & Co.

Borax—
Germany, £25. F. Stahlschmidt & Co.

Barytes—
Holland, 105 cks. Magee, Taylor, & Co.
Germany, 22 W. Harrison & Co.
,, 23 Constable, Henderson, & Co.
Belgium, 146 A. Zumbeck & Co.
,, 22 O'Hard & Hoar
Sydney, 22 W. Harrison & Co.
Belgium, 109 A. Zumbeck & Co.

Caoutchouc—
Zanzibar, 37 c. Beresford & Co.
,, 259 Anderson, Weber, & Smith
,, 39 Wrightson & Son
,, 23 A. Frey & Co., Ltd
Holland, 12 Sawer, Mead, & Co.
France, 60 Flageollet & Co.
,, 25 Arnati & Harrison
Zanzibar, 14 Beresford & Co.
,, 111 L. & I. D. Jt. Co.
,, 62 Clarke & Smith
Portugal, 80 Lewis & Peat
,, 9 Forbes, Forbes, & Co.
,, 48 Wallace Bros.
E. Indies, 30 Hale & Son
France, 38 Beresford & Co.
Singapore, 200 Huttenbach & Co.

Caustic Potash—
France, 31 pks. F. W. Berk & Co.
Holland, 111 c. Beresford & Co.

Cream of Tartar—
France, 5 cks. W. V. Robinson & Co.
,, 5 B. & F. Wf. Co. Ltd.
,, 11 W. C. Bacon & Co.
,, 5 C. F. Gerhardt
Italy, 20 pks. B. & F. Wf. Co. Ltd.
Holland, 8 Middleton & Co.
France, 5 B. & F. Wf. Co., Ltd.
Italy, 5 ,,

Copper Ore—
Pt. Darwin, 24 t. Vivian, Younger, & Co.

Chemicals *(otherwise undescribed)*
Germany, £154. T. H. Lee
,, 25 ,,
,, 33 Johnson & Co.
Holland, 10 Phillips & Graves
Germany, £8. T. H. Lee
,, 25 H. J. Perlbach & Co.
,, 395 A. & M. Zimmermann

Dyestuffs—
Orchella
Zanzibar, 15 pks. Wrightson & Son
Indigo
E. Indies, 10 chts. W. Isted
,, 14 L. & I. D. Jt. Co.
,, 5 Benecke, Souchay, & Co.
,, 23 Ernsthansen & Co.
Cochineal
Canaries, 9 pks. Swanston & Co.
,, 5 Kuhner, Henderson, & Co.
Valonia
Sydney, 52 t. Hicks, Nash, & Co.
Smyrna, 27 J. Graves
,, 100 Anning & Cobb
Tanners' Bark
Germany, 11 t. T. H. Lee
Holland, 11 Sawer, Mead, & Co.
U. S., 34 A. J. Humphrey
Holland, 26 S. Barrow & Bros.
,, 40 J. J. Williamson & Sons
,, 5 Bevington & Sons
Penang, 3 Neill, Topping, & Co.
Adelaide, 24 Flack, Chandler, & Co.
Sydney, 19 Hicks, Nash, & Co.
Germany, 10 A. & W. Nesbitt
Holland, 2 E. Polock
Melbourne, 198 Baxter & Hoare
Gambier
Germany, 86 pks. H. Lambert
Singapore, 420 Beresford & Co.
Canaries, 429 Cox, Paterson, & Co.
,, 141 Brinkmann & Co.
Singapore, 169 Evans & Co.
,, 294 R. & J. Henderson
Argols
Austria, 266 pks. Thames S. T. Co.
Italy, 1,071 B. Jacob & Sons
Sumac
Italy, 800 pks. J. Kitchen, Ltd.
Extracts
France, 20 T. H. Lee
Denmark, 1 G. Scrutton & Co.
France, 80 Prop. Chmbln's Wf.
Austria, 230 A. J. Humphrey
Logwood
Jamaica, 24 t. Anderson, Anderson, & Co.
,, 52 S. Dobree & Sons
Fustic
Jamaica, 1 t. ,,
,, 16 Anderson, Anderson, & Co.
,, 27 Park, Macfadyen & Co.

Glycerine—
Germany, £123 T. H. Lee
,, 195 Beresford & Co.
,, 90 H. Lambert
,, 60 Beresford & Co.
Holland, 62 F. W. Heilgers & Co.

Gutta Percha—
H. Kong, 20 c. Rehder & Co.
U. States, 20 Prop's Butler's Whf.
Singapore, 244 Huttenbach & Co.
,, 463 Kuttenbach & Schmitz

Glucose—
Germany, 200 pks. 200 cwts. J. Barber & Co.
,, 3 160 C. F. Webster & Co.
,, 50 50 Botolph & Nichs Whvs Co. Ltd.
France, 100 100 ,,
,, 300 300 J. Barber & Co.
,, 120 120 Barrett, Tagant, & Co.
,, 100 200 Dutrulle, Solomon, & Co.
U S. 94 517 T. H. Lee
,, 44 792 T. M. Duche & Sons
,, 50 283 Horne & Co.
,, 50 238 Soundy & Son
Germany, 20 104 Barr, Moering, & Co.
,, 300 300 J. Barber & Co.
U.S. 400 400 Barrett, Tagant, & Co.
Germany, 200 200 J. Barber & Co.
,, 6 6 R. E. Drummond & Co.
,, 400 400 Trier, Meyer, & Co.
U.S. 95 580 M. D. Co.

Isinglass—
Holland, 3 pks. Adam, Pearson, & Co.
Singapore, 6 Proptrs. Bull Wbf.
France, 12 H. Gluck & Co.
N. Russia, 6 Mwll. Dk. Co.

Manure—
Germany, 200 t. F. W. Berk & Co.
France, 181 Anglo Contntl. G. Wks.
Belgium, 250 Leach & Co.
France, 240 Lawes Manure Co. Ltd.
Phosphate Rock
Montreal, 250 t. A. Hunter & Co.
,, 90 ,,
U.S. 2,949 Wyllie & Gordon

Manganese Ore—
Poti, 260 t. G. F. Galbraith

Nitre—
Germany, 14 cks. Craven & Co.
,, 40 kgs. Baiss Bros. & Co.
Holland, 7 cks. J. Owen

Naphtha—
Holland, 107 pks. Lister & Biggs
,, 14 cks. Stein Bros.
,, 6 drs. Domeier & Co.
,, 6 T. H. Lee

Potassium Carbonate—
France, 12 pks. Beresford & Co.

Potassium Bicarbonate—
Holland, £40 A. & M. Zimmermann

Phosphoric Acid—
Germany, 20 pks. Phillipps & Graves

Pyrites—
Spain, 2,046 t. C. Tennant, Sons, & Co.

Plumbago—
Germany, 52 cks. Props. Scott's Whf.
E. Indies, 201 brls. J. Owen
,, 199 R. G. Hall & Co.
,, 119 G. Wark & Sons
,, 44 L. & I. D. Jt. Co.

Pitch—
N. Russia, 300 brls. Malcolm & Co.
,, 250 cks. Linck, Moeller, & Co.

Paraffin Wax—
U.S. 100 brls. E. & H. Holdsworth
,, 381 pks. H. Hill & Sons
,, 1,380 brls. G. H. Usmar & Co.

Sodium Acetate—
France, 9 pks. Prop. Hay's Wf.
,, 18 ,,

Stearine—
Germany, 104 sks. Beresford & Co.
Belgium, 62 W. Balchin
Holland, 13 cks. Perkins & Homer

Sodium Sulphate—
Holland, £30 Fuerst Bros

Saltpetre—
Germany, 14 cks. Craven & Co.
,, 100 T. Merry & Son
E. Indies, 587 bgs. Ralli Bros.
,, 765 pks. C. Wimble & Co.
,, 165 cks. L. & I. D. Jt. Co.
Germany, £50 H. Lambert

Tartaric Acid—
Holland, 7 pks. W. C. Bacon & Co.

Tar—
N. Russia, 3,285 brls. Linck, Moeller, & Co
,, 4,379 ,,
Sweden, 1,000 ,,

Tartars—
Italy, £350 Howards & Son

Ultramarine—
Germany, 2 cks. J. Kitchin Ltd.
Holland, 20 Seaward Bros.
Germany, 24 cs. G. Steinhoff
Belgium, 4 cks. Leach & Co.

Zinc Sulphate—
Germany, £70 Grosscurth & Lubold[t]

Zinc Oxide—
Holland, 150 cks. Prprs. of Dowgate Dk.
,, 35 brls. M. Ashby, Ltd.
U.S. 100 ,,
Holland, 300 cks. Soundy & Son
,, 25 H. Hudson & Co.
,, 70 brls. M. Ashby, Ltd.
,, 100 N. Smith
,, 50 M. Ashby, Ltd.

LIVERPOOL.

Week ending August 26th.

Ammonia—
New York, 20 cyls. Kilbourn, Bedford & Co.

Acetate of Lime—
New York, 777 bgs.

Bones—
Vizagpatam, 780 bals.
Coconada, 12,226 bgs.
Constantinople, 547

Borax—
Hamburg, 21 cks.

Borate of Lime—
Antofagasta, 1,252 bgs. Cockbain, Allardice & Co.

Copper Ore—
Hamburg, 575 bgs.

Copper Oxide—
Hamburg, 1 cks.

Cream of Tartar—
Barcelona, 5 cks.
Rotterdam, 4
Genoa, 5

Caoutchouc—
Bayin, 7 cs Edwards Bros.
" 4 1 ck. Pickering & Berthoud
" 1 F. & A. Swanzy
Grand Bassam, 2 T. E. Tomlinson & Co.
" 1 F. & A. Sanzy
" 1 A. Sandle & Co.
" 3 W. D. Woodin
" 1 1 Radcliffe & Durant
" 1 A. Millerson & Co.
" 6 1 Millward, Bradbury & Co.
" 8 2 Edwards Bros.
" 1 Ellis & Co.
" 10 Pitt Bros.
Cartagena, 32 bls. Stiebel
C. C. Castle, 1 cs. 2 C. L. Clare & Co.
" 3 W. D. Woodin
" 1 T. C. Tomlinson & Co.
" 3 J. Smith
" 1 2 Challoner & Co.
" 5 W. B. McIvor & Co.
" 2 5 Grimwade, Ridley & Co.
" 3 W. Duff & Co.
" 1 Ihlers & Bell
" 4 A. Reis
" 1 Davies, Robbins & Co.
" 3 10
Axim, 1 Pickering & Berthoud
Opobo, 1 cs.
Addah, 10 F. & A. Swanzy
" 1 2 E. H. Perrin
Accra, 6 J. J. Fischer & Co.
" 31 J. P. Werner
" 5 F. & A. Swanzy
" 1 6 Hutton & Co.
" 2 Davies, Robbins & Co.
" 2 Pickering & Berthoud
Winnebah, 1 brl. C. Lane & Co.
C. C. Castle, 1 cs. 3 Radcliffe & Durant
" 17 A Miller, Bros. & Co.
" 3 Taylor, Laughland & Co.
" 1 Edwards Bros.
" 1 F. & A. Swanzy
Banana, 30 brls. 6 bgs. Daumas & Co.
Quitta, 1 ck. J. H. Rayner & Co.
" 4 F. & A. Swanzy
Salt Pond, 3 W. Griffiths & Co.
" 14 Pickering & Berthoud
" 2 W. B. McIvor & Co.
" 2 cs. 15 Radcliffe & Durant
" 6 A. Miller, Bros. & Co.
" 9 Edwards Bros.
" 1 A. Millerson & Co.
" 1 T. E. Tomlinson & Co.

Caoutchouc—*continued.*
C. C. Castle, 1 cs. 1 ck. J. Smith
" 3 Taylor, Laughland & Co.
" 4 2 F. & A. Swanzy
" 8 W. B. McIvor & Co.
" 4 C. Lane & Co.
" 2 Ellis & Co.
" 2 8
" 8 A. Miller, Bros. & Co.
Sherbro, 3 brls. Cie Francaise &c.
Sierra Leone, 38 Pickering & Berthoud
" 11 Paterson, Zachonis & Co
" 2 1½ brl. N. Waterhouse & Sons
" 9 pns. Broadhurst, Son & Co.
" 5 30 brls.

Chemicals *(otherwise undescribed)*
Rotterdam, 5 cks.
Rouen, 44 cks. Co-op. W'sale Society, Ld.
Havre, 7 cs. Cunard S. S. Co. Ld.

Dyestuffs—
Extracts
New York, 40 bxs.
Philadelphia, 25 brls.
Boston, 40 bxs.
Yellow Berries
Constantinople, 60 bgs. S. & S. Gulbenkian
Valonia
Constantinople, 14 bgs. A. Papozaglon
" 313
Logwood
Hamburg, 35 ps.
Fustic
Tampico, 21,626 ps. Ugarte
Carthagena, 1,613 sks. Rosing Bros.
Colon, 612 ps. H. Lovitt
Divi divi
Hamburg, 118 bgs.
Orchella
Lisbon, 305 bgs.
Sumac
Barcelona, 50 bgs.
Palermo, 350 bgs 200 bls.
Cochineal
Gr. Canary, 8 bgs. H. Henderson & Co.
Las Palmas, 4 bgs. Widow, Duranty Co.

Dyestuffs *(otherwise undescribed)*
Boston, 200 bxs.

Glucose—
Hamburg, 34 cks.
Rouen, 5 Co-op. W'sale Society, Ltd.
New York, 489 brls.

Horn Piths—
Bremerhaven, 20,000
Rouen, a qty. Co-op. W'sale Society, Ltd.

Manganese Ore—
Poti, 2,100 t. R. & D. Jones
Gothenburg, 150 Macqueen Bros.
Carrizal, 498
Coquimbo, 393

Manganese—
Bordeaux, 203 t. R. J. Francis & Co.

Phosphoric Acid—
Bremerhaven, 10 bskts.

Potash—
Rouen, 21 dms. 36 cks.

Pyrites—
Huelva, 1,531 t. Matheson & Co.
" 1,441 Tennants & Co.

Phosphate of Lime—
Treport, 300 t,

Sulphur Ore—
Huelva, 1,515 Matheson & Co.

Saltpetre—
Hamburg, 104 cks.

Salt—
Calcutta, 5 bgs.

Salammoniac—
New York, 13 cks. R. Crooks

Tannic Acid—
Hamburg, 16 cks.

Tartar Emetic—
Hamburg, 8 cks.

Tar—
Archangel, 1,966 brls. J. H. Hindley & Co.

Tartar—
Bari, 4 cks.
Bordeaux, 2
" 70

Ultramarine—
Rotterdam, 18 cs. 6 cks.

Waste Salt—
Hamburg, 360 t.

Zinc Sulphate—
Hamburg, 31 cks.

Zinc Oxide—
New York, 100 brls.
" 50
St. Nazaire, 25

Zinc Ashes—
Boston, 31 brls.

HULL.

Week ending August 28th.

Albumen—
St. Petersburg, 20 cs.
Hamburg, 11 Wilson, Sons & Co.

Acids *(otherwise undescribed)*
Rotterdam, 1 ck. W. & C. L. Ringrose

Acetic Acid—
Hamburg, 1 cs. Furley & Co.

Barytes—
Antwerp, 44 cks. H. F. Pudsey
" 100 bgs.
Bremen, 23 cks. T. W. Flint & Co.

Chemicals *(otherwise undescribed)*
Hamburg, 17 pks. Wilson, Sons & Co.
" 38 cks.
Antwerp, 52 pks. Wilson, Sons & Co.
Bremen, 10 crbys. Veltmann & Co.

Dyestuffs—
Bennet
Stettin, 1 ck.
Alizarine
Rotterdam, 3 cks. W. & C. L. Ringrose
" 33 pks. "
" 50 cks. Hutchinson & Co.
" 64 Hutchinson & Son
" 9 2 cs. W. & C. L. Ringrose
Extracts
Hamburg, 3 brls.

Ferro Manganese—
Rotterdam, 40 cks. Furley & Co.

Graphite—
Hamburg, 18 cks. C. E. Johnson & Co.

Glycerine—
Hamburg, 10 cs. Lofthouse & Saltmer

Glucose—
Hamburg, 100 bgs.
New York, 85 brls.
Hamburg, 200 bgs. Bailey & Leetham
Stettin, 600 C. M. Lofthouse & Co.
" 400

Phosphate—
Ghent, 160 t. Wilson, Sons & Co.
Montreal, 300

Phosphorus—
Rouen, 10 cr. Rawson & Robinson

Pitch—
Hamburg, 59 brls.
Rouen, 89 cks.
Amsterdam, 14 H. F. Pudsey

Soda—
Rotterdam, 8 cks. G. Lawson & Sons

Silica—
Hamburg, 35 bgs.

Stearine—
Rotterdam, 10 bgs. Wilson, Sons & Co.
" 3 bls. Hutchinson & Son

Saltpetre—
Hamburg, 12 kgs. C. M. Lofthouse & Co.
" 4 brls.

Tar—
St. Petersburg, 10 brls. Wilson, Sons & Co.

Turpentine—
Libau, 32 brls.

Tartaric Acid—
Rotterdam, 10 cks. Hutchinson & Son

Ultramarine—
Rotterdam, 8 cks. Hutchinson & Son

TYNE.

Week ending August 27th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.

Copper Oxide—
Rotterdam, 2 cks. Tyne S. S. Co.

Glucose—
Hamburg, 100 bgs. Tyne S. S. Co.

Pyrites—
Antwerp, 50 bgs. Tyne S. S. Co.

Phosphate—
Valle, 560 t.

Zinc Oxide—
Antwerp, 10 brls. Tyne S. S. Co.

GLASGOW.

Week ending August 28th.

Alumina Sulphate—
Rotterdam, 41 cks. J. Rankine & Son

Boracic Acid—
Amsterdam, 1 ck.

Dyestuffs—
Sumac
New York, 25 bgs.
Extracts
Rotterdam, 2 cks. J. Rankine & Son
Antwerp, 3
Rotterdam, 2 " "
Logwood
Jamaica, 663 t.
Hamburg, 20,510 pcs. Mc Arthur Scott & Co.
Alizarine
Rotterdam, 30 cks.

Glucose—
New York, 125 brls.

Tartar—
Bordeaux, 7 cks.

Ultramarine—
Antwerp, 10 cs.

Zinc Oxide—
Antwerp, 60 cks.
New York, 100 brls.

GOOLE.

Week ending August 20th.

Alumina Sulphate—
Antwerp, 39 cks.

Antimony—
Boulogne, 3 cks.

Caoutchouc—
Boulogne, 7 cks.

Dyestuffs—
Madder
Rotterdam, 3 cks.
Alizarine
Rotterdam, 43 cks.
Logwood
Jamaica, 550 t.
Tobasco, 380
Dyestuffs *(otherwise undescribed)*
Boulogne, 73 cks. 4 cs.

Glucose—
Hamburg, 350 bgs. 25 cks.
Calais, 200
Dunkirk, 180

Muriate—
Rotterdam, 40 cks.

Potash—
Calais, 41 drms. 14 cks. 14 brls.
Dunkirk, 39

Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 3 cks.

Waste Salt—
Hamburg, 628 bgs. 680 t.

GRIMSBY.

Week ending August 23rd.

Albumen—
Dieppe, 10 cs.

Dyestuffs *(otherwise undescribed)*
Hamburg, 25 cks.
Antwerp, 4 pks.

Zinc Ashes—
Antwerp, 44 pks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.
Week ending Aug. 20th.

Alum Cake—
Melbourne, 9 t. 15 c. £23
Ammonium Sulphate—
Teneriffe, 2 t. 10 c. £31
Ammonia—
Penang, 5 cs. £102
Acids *(otherwise undescribed)*
Cologne, 250 bts. £400
Bisulphate of Lime—
Rangoon. 3 t. 9 c. £67
Caustic Soda—
Philadelphia, 30 t. £305
,, 61 10 c. 610
Oporto, 6 7 33
Carbolic Acid—
Philadelphia, 1,021 gls. £100
Cream of Tartar—
Wellington, 4 c. £22
Calcutta, 3 10
Dunedin, 5 25
Algoa Bay, 2 13
Sydney, 1 t. 109
Townsville, 5 26
Cape Town, 11 47
Carbolic Solid—
Yokoptiogo, 40 cs. £183
Copperas—
Madras, 4 t. 12 c. £18
Copper Sulphate—
Stettin, 4 t. 19 c. £84
Madeira, 1 23
Pasages, 13 12 301
Odessa, 3 70
Calcutta, 5 115
M. Video, 10 12 182
Citric Acid—
Cape Town, 1½ c. £9
Lisbon, 10 cks. 73
Boulogne, 2 15
Hamburg, 1 t. 138
Adelaide, 2 16
Cologne, 10 70
Odessa, 10 74
Melbourne, 1 5 180
St. Petersburg, 2 10 373
Genoa, 15 114
St. Petersburg, 20 cks. 700
Paris, 10 c. 74
Coal Products—
Carbolic Solid
Genoa, 10 cs. £50
Carbolic Acid
Genoa, 20 cks. £42
Anthracene
Dusseldorf, 165 cks. £1,052
,, 61 344
Rotterdam, 134 923
,, 61 415
Naphthaline
Stettin, 32 cks. £47
Benzole
Rotterdam, 20 pns. 48 rlts. £720
Hamburg, 19 drs. 305
Rotterdam, 17 cks. 333
Terneuzen, 40 702
Rotterdam, 10 47 1,023
Tar
Rangoon, 2 00 rlts. £105
Pitch
Boston, 125 bls. £39
Antwerp, 171 t. 222
Havre, 32 cks. 100
Disinfectants—
Hamburg, 25 cks. £125
Melbourne, 23 t. 4 c. 197
Hamburg, 50 cks. 300
Singapore, 400 gls. 60
Penang, 200 35
Guano—
Landernean, 95 t. £950
Iron Sulphate—
M. Video, 5 t. 8 c. £12
Manure—
Riga, 314 t. 16 c. £930
Hamburg, 9 17 35
Natal, 20 95
Riga, 201 8 630
Jamaica, 10 112
Gothenburg, 243 12 985
Riga, 148 16 494
Stettin, 24 13 212
Rouen, 100 800
Dunkirk, 39 2 49
Stettin, 341 14 1,432
Nitric Acid—
Jersey, 24 pks. £43
Potassium Iodide—
Yokoptiogo, 2 cs. £110
Potassium Bichromate—
Salonica, 1 t. 2 c. £40
,, 1 3 40
Phosphorus—
Canaria, 1 t. 10 c. £15
Potassium Cyanide—
Calcutta, 7½ c. £14
Sheep Dip—
Cape Town, 3 t. 7 c. £150
Algoa Bay, 550 gls. 124
Natal, 20 cs. 56
Algoa Bay, 250 drs. 68
Saltpetre—
Madeira, 16 c. £22
Oporto, 7 t. 10 150
Corunna, 2 43
Melbourne, 2 10 54
Oporto, 3 14 75
Soda Crystals—
Nelson, 5 t. 7 c. £16
Sydney, 16 5 50
Superphosphate—
Stettin, 545 t. 16 c. £2,470
Riga, 247 1 744
Salt Cake—
Helsingfors, 250 t. 5 c. 350
Sodium Sulphate—
Calcutta, 10 cs. £10
Ghent, 35 t. 35
Tartaric Acid—
Wellington, 4 c. £28
Bombay, 4 32
Algoa Bay, 5 33
Melbourne, 55 kgs. 315
Sydney, 10 67
Melbourne, 1 t. 5 170

LIVERPOOL.
Week ending August 23rd.

Alkali—
Genoa, 37 tcs.
Albumen—
Lisbon, 9 c. 3 q. £42
Ammonia—
B. Ayres. 1 t. £45
New York, 19,807 lbs. 185
Alum Cake—
Calcutta, 7 t. 12 c. 3 q. £50
Alexandria, 2 18 1 14
Gothenburg, 40 3 123
Alum—
Melbourne, 7 t. 9 c. £40
Madras, 26 2 155
San Francisco, 20 t. 100
Smyrna, 2 15 14
Odessa, 2 13 13
,, 2 12 13
Aleppo, 3 11 18
Ammonium Carbonate—
Montreal, 1 t. 2 c. 3 q. £32
B. Ayres, 10 22
Philadelphia, 1 15 2 60
Genoa, 10 2 17
Marseilles, 13 4 22
Montreal, 11 2 14
Barcelona, 2 2 3 68
Ammonium Sulphate—
New York, 48 t. 10 c. £582
Gr. Canary, 2 24
New York, 53 4 583
Demerara, 30 1 351
Valencia, 101 1 2 q. 1,222
,, 50 8 3 587
Ammonium Muriate—
Galatz, 1 t. £25
Gefle, 1 8 c. 41
Naples, 1 3 1 q. 29
Marseilles, 3 1 8
Philadelphia, 7 4 149
Palermo, 10 13
Philadelphia, 22 15 1 525
Melbourne, 12 16
New York, 14 11 360
Boracic Acid—
Rotterdam, 2 c. 2 q. £5
Boston, 18 2 34
Yokohama, 1 t. 38
Bleaching Powder—
Alexandria, 20 kgs.
Bordeaux, 29 cks.
Bleaching Powder—*continued.*
Boston, 90 cs. 235
Genoa, 244
Hamburg, 57
Havana, 25
Montreal, 33
Naples, 15
San Francisco, 325 brls.
Vera Cruz, 29
Antwerp, 28
Boston, 228 tcs. 370
Genoa, 28
Havana, 20
Lisbon, 14
New York, 169 314
Trieste, 27
Amsterdam, 2
Bisulphide of Carbon—
Rio de Janeiro, 4 t. 18 c. £46
Borax—
Lisbon, 1 t. 2 c. £31
Rotterdam, 16 3 q. 24
Syra, 3 5
Alexandria, 12 2 18
Constantinople, 10 14
Brimstone—
Calcutta, 16 t. 5 c. £85
,, 3 14 1 q. 20
Madras, 4 11 3 34
Stettin, 20 2 105
Trinidad, 3 18 21
Vera Cruz, 30 131
Calcium Sulphate—
Montreal, 2 c. £20
Caustic Soda—
Adelaide, 5 bxs. 10 brls. 1 pkg.
Bari, 99 dms.
Batavia, 30
Beyrout, 15
Bilbao, 150
Boston, 325
Carthagena, 10
Copenhagen, 10
Genoa, 20
Lisbon, 6
Madrid, 82
Melbourne, 60 22
Messina, 30
Nantes, 18
Naples, 51
Newfairwater, 30
New York, 387
Oporto, 10
Pernambuco, 30
Philadelphia, 200 160
Port Elizabeth, 20 bxs.
Rio Grande do Sul, 100 dms.
Rotterdam, 28
Santander, 22 22 cks.
Seville, 25
Valencia, 10
Venice, 10
Vigo, 3
Algoa Bay, 5 bxs.
Antwerp, 5 cks. 54 dms.
Bordeaux, 104
Boston, 25
B. Ayres, 25
Catania, 15
Gefle, 25
Genoa, 25
Ghent, 18 brls.
Hamburg, 35
Leghorn, 10
Messina, 10
Mexico City, 100
Montreal, 24 cks.
Naples, 20
Newfairwater, 90
New York, 4 185
Odessa, 125
Pasages, 5
Penang, 300
Punta Arenas, 12
Rangoon, 50
Rotterdam, 12
Stettin, 15
Trieste, 10
Valencia, 32
Valparaiso, 60
Vera Cruz, 200 2 cs.
Caustic Potash—
Chicago, 1 t. 1 c. £24
Cobalt Oxide—
Gijon, 2 c. £90
Copperas—
Montreal, 2 t. 7 c. 3 q. £50
Calcutta, 14 5 27
Montreal, 10 8 21
Calcium Chloride—
B. Ayres, 2 t. 10 c. £7
New York, 15 31
Charcoal—
Barcelona, 2 t. 3 q. £15
Hong Kong 46 18 c. 480
Carbolic Acid—
Marseilles, 1 t. 9 c. 1 £137
Genoa, 7 1 28
New York, 2 2 100
Philadelphia, 2 10 54
Seville, 6 23
Shanghai, 6 3 10
Hamburg, 1 7 14
New York, 3 2 42
Copper Sulphate—
Calcutta, 5 t. 8 c. £102
Palermo, 1 10 1 q. 27
Odessa, 7 2 3 123
Calcutta, 5 87
Leghorn, 19 2 16
Trieste, 5 1 2 86
Singapore, 3 7 62
Genoa, 14 18 2 238
Konigsberg, 1 19
Bordeaux, 20 4 1 400
Montreal, 5 108
M. Video, 9 9
Antwerp, 5 7 118
Copenhagen, 1 2 2 28
Danzig, 24 9 2 420
Bombay, 5 103
Bordeaux, 19 19 3 342
Brindisi, 11 225
Nantes, 12 4 2 244
Vera Cruz, 4 80
Hamburg, 9 1 2 155
Danzig, 10 3 10
Copenhagen, 1 7 3 24
Stettin, 4 1 2 71
Disinfectants—
Valparaiso, 3 cs. £15
Alexandria, 41 pks. 70
Calcutta, 5 cs. 23
Baltimore, 13 90
Epsom Salts—
Calcutta, 107 brls.
Havre, 32
Rio de Janeiro, 50 kgs.
Montreal, 25 brls.
Piræus, 4 cks.
Gypsum—
New York, 10 t. 2 c. £30
Boston, 1 10 2 q. 9
Iron Oxide—
Hong Kong, 16 c. £6
Manure—
Phosphate Rock
Hamburg, 5 t. 9 c. 3 q. £13
Manure—
Hamburg, 18 t. 17 c. 1 q. £90
Havre, 50 3 1 290
Bordeaux, 49 6 347
St. Nazaire, 903 8 4,751
Las Palmas, 19 120
Valencia, 50 380
Magnesia—
Rio de Janeiro, 10 cs.
Oxalic Acid—
Amsterdam, 3 c. £5
Trieste, 1 t. 10 1 q. 53
Genoa, 4 15
Potassium Nitrate—
Carthagena, 4 t. 19 c. 2 q. £87
Potassium Prussiate—
B. Ayres, 3 c. £5
Potassium Carbonate—
Philadelphia, 18 c. 2 q. £24
Chicago, 6 t. 4 89
Potassium Bicarbonate—
Odessa, 10 c. £16
Potassium Bichromate—
Monte Video, 1 t. 18 c. £82
Rio de Janeiro, 2 18 1 q. 100
Alexandria, 1 4 42
Potassium Chlorate—
B. Ayres, 2 c. £5
Vigo, 2 11
Havana, 1 t. 15 83
Copenhagen, 2 88
Gothenburg, 17 10 740
Hamburg, 2 85
New York, 7 10 337
Hong Kong, 5 11
Vera Cruz, 10 23
Rio de Janeiro, 5 220

Potassium Chlorate—*continued.*
Hiogo 7 t. 10 c. £350
St. Petersburg,3 120
San Francisco,1 5 52
Odessa, 2 100
Oporto, 5 13
Hiogo, 10 500
Leghorn, 10 25
St. Petersburg,5 200
Arica, 4 cs. 6

Picric Acid—
New York, 17 c. 2 q. £120

Phosphorus—
Havana, 10 c. £133
Hong Kong, 1 11
Vera Cruz, 7 1 q. 46
Mexico, 17 144

Sodium Biborate—
Hamburg, 2 t. 2 c. 1 q. £64
Montreal, 4 1 1 126
Antwerp, 5 4 2 157
Stettin, 6 5 188
Rotterdam, 2 12 1 79
New York, 10 3 15

Sodium Carbonate—
Boston, 56 brls. 100 cks.
Montreal, 80

Soda Ash—
Baltimore, 100 tcs.
Bari, 3 cks.
Boston, 191 bgs. 255
Calcutta, 4
Corfu, 4 brls.
New York,221 tcs. 402
Philadelphia, 100
San Francisco, 73
Valparaiso, 10 brls.
Santander, 21
Amsterdam, 4
Baltimore, 335 394 tcs
Beyrout, 50
Boston, 496 bgs. 113 125
B. Ayres, 100 brls.
Calcutta, 7
Hong Kong, 10
M. Video, 30
Montreal, 11
New York, 968
" 237
Odessa, 100
Philadelphia, 6 500
Rio de Janeiro, 100 brls.
Smyrna, 115
Sydney, 122
Syra, 10
Townsville, 66 cks.

Sodium Silicate—
Ancona, 20 cks.
Bilbao, 58 brls.
Montreal, 10
Rotterdam, 15
Melbourne, 40
Sydney, 40

Sodium Bicarbonate—
Copenhagen, 20 kgs.
Genoa, 50
Madras, 50
St. Petersburg, 50
Stettin, 286
Calcutta, 1,000
Hamburg, 10 cks.
Madras, 156
St. John's, Nfld., 20
Syra, 1 ck.

Soda Crystals—
Malta, 100 brls.
Montreal, 2 cs.
St. John's, Nfld. 2
Adelaide, 67 brls.
Alexandria, 30 kgs.
Boston, 280 brls.
Hamburg, 100 cks.
New York, 330
St. John's, Nfld. 40 kgs.

Salt—
Antwerp, 50 t.
Banana, 312
Calcutta, 2 935
Cameroons, 186
Charleston, 490
Demerara, 111½
E. London, 62
Eckernforde, 238
Gaboon, 15
Gefle, 200
Iquique, 6½
Lagos, 105
Milwaukee, 65
Montreal, 1,625
Old Calabar, 404 1 c.
Para, 35
Quebec, 1,100
Reykjavik, 57
Rotterdam, 200
St. Petersburg, 2¼
San Francisco, 89 6

Salt—*continued.*
Sherbro, 350 t. 4 c.
Wilmington, 886
St, John 450
Addah, 5
Antwerp, 35
Black Point, 10
Cette, 20 cks.
Eloby, 12½
Gaboon, 12½
Ghent, 190
Mandyr, 25
Montreal, 551
Old Calabar, 75
Portland Or. 70
Quebec, 200½
Rangoon, 3,454
Valparaiso, 94 13 c.

Sulphur—
Iquique 50 t. 14 c. 3 q. £285
Bombay, 2 9
Pernambuco 1 2 3 8
Rio de Janeiro,1 1 1 7

Saltpetre—
Maceio, 2 t. 18 c. £65
Maranham, 4 5
Carthagena, 4 18 2 q. 86

Superphosphate—
Gr. Canary, 8 t. 3 c. £20
Bilbao, 100 350
Hamburg, 10 2 q. 32
Nantes, 400 14 700
" 30 1 3 97

Sheep Dip—
Natal, 4 t. 8 c. £180
" 100 gls. 20

Sugar of Lead—
Rio de Janeiro, 6 c. 2 q. £9

Sodium Bichromate—
Piræus, 1 t. 10 c. £38
Havre, 6 2 115

Salammoniac—
Bilbao, 10 c. 3 q. £20
Patras, 2 3 5
Philadelphia,2 t. 11 1 19
New York, 5 9
Trieste, 1 1 2 40
Montreal, 1 25
Genoa. 1 1 3 35
Alexandria, 2 68

Sulphur—
Boston, 25 t. £110
Montreal, 50 220
Boston, 50 2 c. 225
" 25 1 110
Montreal, 50 2 225

Sodium Nitrate—
New York, 13 c 1 q. £17
Las Palmas,18 t. 16 157
Gr. Canary, 1 1 3 9
Oporto, 2 2 1 17
Batoum, 20 3 2 170
Malaga, 6 6 52
New York, 2 3 1 50

Tartaric Acid—
B. Ayres, 5 c. 2 q. £41

Zinc Muriate—
Bombay, 3 t. 16 c. £61
" 2 4 90

Zinc Oxide—
Philadelphia, 240 lbs. £14

TYNE.

Week ending August 27th.

Alkali—
Rotterdam, 19 t. 8 c.

Alumina Sulphate—
Antwerp, 2 t. 7 c.
Rouen, 5 8

Barytes Carbonate—
Rouen, 10 t.

Barytes—
Rouen, 30 t.

Barium Chloride—
Rouen, 6 t. 9 c.

Bleaching Powder—
Genoa, 28 t. 7 c.
St. Petersburg, 82 t. 16 c.
Helsingfors, 45 4
Landskrona, 13
Stockholm, 50
Hamburg, 33 6
" 4 6
Antwerp, 60
" 10 7
Odense, 28 7
Lisbon, 29 18
Rotterdam, 19
Rouen, 24 18

Borax—
Stockholm, 5 c.

Calcined Magnesia—
Genoa, 6 t. 1 c.
Hamburg, 3 q.

Copperas—
Abo, 20 t. 14 c

Caustic Soda—
Stockholm, 7 t. 9 c.
Christiania, 6 4
Seville, 30
Dunkirk, 1 9

Epsom Salts—
Gothenburg, 1 t. 1 c.

Litharge—
St. Petersburg, 5 c.
Stockholm, 2 t. 16
" 1 8

Magnesia—
Rouen, 2 c.

Potassium Chlorate—
Hamburg, 10 c.
Antwerp, 2 t.

Potassium Bichromate—
Odense, 7 c.

Soda—
Abo, 1 t. 17 c.
Helsingfors, 5
Stockholm, 11 1
" 21 11
Aarhuus, 14 17
Fredrikshavn, 5 6
Rotterdam, 6 4

Soda Ash—
Helsingfors, 50 t. 5 c.
Christiania, 9 17
Gothenburg, 10 9

Superphosphate—
Christiania, 8 t.
Esbjerg, 24 10 c.

Sodium Chlorate—
Hamburg, 1 t. 5 c.

Sodium Sulphate—
Rotterdam, 10 t. 4 c.

Sodium Bicarborate—
Odense, 4 t. 6 c.

HULL.

Week ending August 26th.

Alkali—
Antwerp, 1 cs. 1 ck.
Bergen, 2
Bari, 20
Trieste, 54

Bone Size—
Rotterdam, 1 cs.

Bleaching Powder—
Drontheim, 39 cks.
Stettin, 168
Trieste, 8
Venice, 25

Caustic Soda—
Christiania, 5 drms.
Hamburg, 1 ck.
Trieste, 35 drms.
Venice, 50

Copper Sulphate—
Antwerp, 88 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 1 cs 4 cks.
Amsterdam, 5 pks.
Bremen, 1
Bergen, 4
Boston, 50
Bordeaux, 20
Copenhagen, 2 2
Christiania, 1 t. 4
Danzig, 1 cs 3 4
St. Petersburg,4 44
Sydney, 20
Venice, 1
Gothenburg,16 56 5
Hamburg, 4 55 9
Konigsberg, 20
New York, 100
Rouen, 40
Rotterdam, 30 233 1
Stettin, 15 22

Dyestuffs *(otherwise undescribed)*
Antwerp, 2 cks.
Boston, 4
Gothenburg, 2
Hamburg, 1 drum.
Rotterdam, 10
St Petersburg, 30 cs.

Manure—
Aarhuus, 328
Copenhagen, 216
Danzig, 700 bgs.
Esbjerg, 385
New York, cks.
Stettin, 281
Venice, 10

Pitch—
Antwerp, 129 t.

Salt—
Abo, 5 t.

Sulphur—
Drontheim, 12 cks.

Turpentine—
Antwerp, 2 drms.
Bergen, 2 cks.

Tar—
Amsterdam, 15 cks.
Christiania, 5
Fiume, 61
Gothenburg, 150
Hamburg, 1
Sydney, 50 drms.

GOOLE.

Week ending August 20th.

Benzole—
Antwerp, 9 cks.

Bleaching Preparations—
Hamburg, 70 cks.

Coal Products—
Rotterdam, 40 cks.

Chemicals *(otherwise undescribed)*
Ghent, 1 cs. 25 cks.
Hamburg, 51

Dyestuffs *(otherwise undescribed)*
Boulogne, 1 cs. 2 drs.
Dunkirk, 1 ck.
Ghent, 1 8 3

Manure—
Hamburg, 456 bgs.
Rouen, 286

GLASGOW.

Week ending August 28th.

Ammonium Carbonate—
Christiania, 5 kgs. £10

Ammonium Muriate—
Italy, 1 t. 3¾ c. £22

Borax—
Stockholm, 15 cks. £182

Bleaching Powder—
Calcutta,121¼ c. £45
San Francisco,302½ c. 128

Epsom Salts—
Christiania, 50 bgs. £20

Ferro Manganese—
Halifax, 20 t. 7 c. £255

Potassium Bichromate—
Rotterdam, 13 cks. £165
Italy, 425 c. 661
" 27 t. 19¾ c £864
Barcelona, 1,409½ 2,410

Paraffin Wax—
Italy, 22.316 lbs. £331
Barcelona, 112
Hong Kong, 1 t. 10 c. £50
Japan, 17 8¼ £398
Italy, 9 ¼ 264
Malta, 11,200 lbs. 150

Pitch—
Madras, 15 t. 3¾ c. £32

Sodium Bichromate—
Italy, 311¼ c. £518
" 46 t. ½ c. £1,073
Barcelona, 82½ 120

Sulphuric Acid—
Bombay, 5 t. 8 c. £32
Colombo, 9 £38. 12s.
Madras, 19 137

Tar—
Japan, 150 glns. £7. 17s.
Stockholm, 5 brls, £3
Colombo, 32 t. 13 c. 81
Madras, 47 6½ 172

GRIMSBY.

Week ending August 23rd.

Coal Products—
Dieppe, 51 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 40 pks.
Hamburg, 10 cs.

PRICES CURRENT.

WEDNESDAY, SEPTEMBER 3, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	62/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅜
Picric .. .. ,,	0	1	0½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	15	0
,, ,, (grey), Hull .. .. ,,	11	12	6
Aniline Oil (pure) .. .. per lb.	0	0	11½
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	7	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	11	10	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	3
,, 50/90 ,, ... ,,	0	3	3
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7¼
,, (crude 60°) .. .. per gallon	0	2	0
Creosote (ordinary) .. .. ,,	0	0	2½
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	4
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	5	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	59	17	6
,, Sulphate .. .. ,,	19	0	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	2	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	10
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	6
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	26	0	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	0	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	0	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	5	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	6⅜
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	5	17	6
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	12	0	0
,, ,, (74 % Caustic Soda) ,, .. ,,	11	10	0
,, ,, (70 % Caustic Soda) ,, .. ,,	10	15	0
,, ,, (60 % Caustic Soda) .. .. ,,	9	15	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	0	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,	0	0	5½
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	100	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	24	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	5	0

THE

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Articles, reports, and correspondence on all matters of interest to the Chemical and allied industries, home and foreign, are solicited. Correspondents should condense their matter as much as possible, write on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication. Sketches should be sent on separate sheets.

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THE CHEMICAL UNION.

THE opponents to the launching of the Chemical Union will, no doubt, be sorry to hear that the combination is practically accomplished. Many have been hoping that their wordy warfare would have prevented the proposed combination, but like all others who enter too zealously into the work they have in hand, they have so far over-reached their point as to show the general public the strength of the alkali maker's position. Many of the arguments which have been used in print have been totally erroneous. It has been stated that the ammonia-soda works have at last commenced manufacturing bleaching powder, and that the plant possessed by the Le Blanc makers is no longer of any use. This is not so. Neither is there any immediate truth in the report, that electrolytic bleaching is superseding the use of the old fashioned bleaching powder solution. It is very well known in the paper trade, to which most of the opponents belong, that at least one firm in this country have, at a large outlay of capital, and with an immense amount of labour, endeavoured to bleach paper pulp by electricity, but only with the result of a most disastrous failure. This is not encouraging for future electrolysers, as it shows that there are many problems connected with bleaching by electricity which cannot be said to be solved at the present time. The fact is, the Alkali Union has a very strong position, and there is no reason why the public should not look quite as favourably upon the proposed combination as they did upon the Salt Union. If anything, the chemical trade, generally possesses more features of interest than the manufacture of salt alone.

The plant cannot by any means be correctly called old and obsolete, and though, no doubt, bleaching by electricity will form a great feature in future industrial operations, it cannot be said that its day has yet arrived. Neither, on the other hand, do we believe that the present system of manufacturing bleaching powder will be for very long continued. The method of to-day is wasteful in the extreme, and at least one process which will shortly be in the market, promises a larger profit to those who carefully manufacture by it. It will be pleasing to know that much of the plant now employed in the ordinary Le Blanc process will come in for manufacturing by the new system, and as the rest of the apparatus required is much less costly than the present plant, we see no reason why the public should be afraid, on that account, to invest its money in supporting the Chemical Union.

There is no reason why any doubt as to the future success of the Union should exist, and that it will become an accomplished fact in some form or other, may as well be realised at once by those who are so vigorously opposing the scheme. As we go to press, the constructive committee of the Chemical Union are reported to be holding a meeting of alkali manufacturers at the North Western Hotel in Liverpool, for the purpose of explaining the present position, and of having their actions confirmed by the trade. At the same time, they will endeavour to ascertain to what extent the shares will be applied for by the vendors, or subsequently subscribed for, if necessary, so that the promoters may know the mini-

mum amount which the public should subscribe, to complete the formation of the company. We believe it has been said that if the public does not subscribe all the desired capital, the alkali manufacturers themselves will take the remainder of the shares.

We wish the Union success, and we feel sure that if they pursue a policy of moderation with regard to prices, it will be to the ultimate benefit, not only of the trade itself but of the public at large. It is a great pity that newspapers of a non-technical character should publish such glaringly misleading statements as they have in the present case, as such a policy is sure to mislead the public, and prevent many from investing in an undertaking towards the success of which their support would materially contribute. The opponents to the formation of the Chemical Union would do far better for themselves by investing in its shares, than by seeking to establish other works, a course which in the end will not only be disastrous to the trade, but inimical to their own interests.

THE ELECTROLYTIC METHOD AS APPLIED TO PALLADIUM.*

By Edgar F. Smith and Harry F. Keller.

OUR knowledge bearing upon the behaviour of this metal towards the current is limited and rather indefinite. In 1868, Wöhler published, in the *Annalen*, **143**, 375, an article entitled, "Ueber das Verhalten einiger Metalle im elektrischen Strom," from which the following facts are taken: Palladium, as the positive pole of a battery, consisting of two Bunsen cells, was immersed in water acidulated with sulphuric acid, when the metal immediately became coated with a deposit having a bright steel-like colour. This deposit is doubtless palladium dioxide, as it liberates chlorine when treated with hydrochloric acid, and carbon dioxide when warmed with oxalic acid. At the same time, black, amorphous metal separated upon the negative pole. Its quantity was slight. In the second edition of *Classen's Quantitative Electrolysis*, p. 72 (American edition), it is stated that a feeble current will deposit palladium in a beautiful metallic state from an acid solution. One Bunsen cell is given as sufficient for this purpose. A more energetic current produces a spongy deposit. Ludwig Schucht has communicated‡ that from an aqueous solution of palladious nitrate, acidulated with a few drops of nitric acid, the current precipitated upon the negative pole a bronze-coloured deposit, which, as it grew more dense, became darker, and finally black in colour. At the positive pole there was a simultaneous deposition of oxide, showing a reddish colour. In alkaline palladic solutions the precipitation of metal was much retarded; the deposition of oxide was also observed.

Our first experience in the electrolysis of palladium salts was acquired from the double cyanide in an excess of potassium cyanide. In such solution a current, generating one cc. oxyhydrogen gas per minute, failed to cause metallic deposition until after the expiration of thirty-six hours; in other words, not until the excess of potassium cyanide had been completely converted into alkaline carbonates. Then the deposit was black in colour, but the precipitation was not at all complete. No deposition of oxide was noticed upon the positive pole. The conduct of the metal in cyanide solution led to the trial of certain separations, the results of which will be given in a later communication. The action of the current (feeble) was also tried upon a solution of palladious chloride, in the presence of a large excess of potassium sulphocyanide. In this case the deposition of metal was exceedingly rapid. Spongy spots were noticeable. The deposit was black in colour. The experiment was made with the solution in the hope that possibly a separation of copper from palladium might be found; but, as these metals separate with equal rapidity from their sulphocyanides, the results are valueless for this purpose.

The next attempt was made with palladammonium chloride, $Pd(NH_3)_2Cl_4$, in just sufficient ammonium hydroxide to retain it in solution. The total dilution of the solution was 125 cc.; the acting current gave 0·9 cc. OH gas per minute. The poles were distant from each other about two inches. Just as soon as the circuit was completed, a yellowish-brown coating appeared upon the spiral of the positive pole; while upon the dish, in connection with the negative pole, a deposit of metal closely resembling the platinum itself in colour made its appearance. After acting through the night the current was interrupted, the metal deposit carefully dried and weighed. The precipitation was incomplete. It was, however, discovered that the deposition at the positive pole, which gradually increased in mass and assumed a black colour, had entirely disappeared. In all instances where the ammonium hydroxide was in decided excess, the precipitation of oxide on the positive pole was not observed. This behaviour is similar to that of nickel when its ammoniacal solutions are electrolyzed. In subsequent experiments the course was somewhat modified. From solutions such as just described, the palladium thrown out upon the platinum dish was extremely slow in dissolving, even in fuming nitric acid, so that it was deemed expedient to first coat the platinum dishes employed in the electrolysis with a layer of silver, varying in weight from 0·1 to 0·3 gram. This was done in the experiments recorded below, and was found to be decidedly advantageous. The layer of silver seemed to hasten the deposition of the palladium.

EXPERIMENT I.

A quantity of palladammonium chloride (= 0·2228 grm Pd) was dissolved in ammonium hydroxide; to this solution were added 20 to 30 cc. of the same reagent (sp. gr. 0·935) and 75 cc. water. The current allowed to act upon this ammoniacal liquid gave 0·9 cc. oxyhydrogen gas per minute. The decomposition continued through the night. At no time was there any oxide deposition upon the anode. The palladium gradually assumed a bright metallic appearance. After drying, the deposit showed about the same appearance as is ordinarily observed with this metal in sheet form. The washing was limited to hot water, and when the deposit was perfectly dry, the dish containing it was covered with a watch glass and exposed to a temperature ranging from 110° to 115° C. This was done to expel any hydrogen that might possibly have been retained by the palladium.

Weight of silvered dish + Pd = 61·9575 grms.
" " " — Pd = 68·7350
0·2225 Pd.

EXPERIMENT II.

In every respect similar to Experiment I, gave

Weight of silvered dish + Pd = 71·9540 grms.
" " " — Pd = 71·7315
0·2225 Pd.

The filtrates from these deposits were warmed for eight hours with ammonium sulphide without showing any formation whatever of palladium sulphide.

In several experiments, with conditions unlike those just described, and where consequently an incomplete precipitation of metal occurred, the digestion with ammonium sulphide produced in every instance, in a very short time, a reddish-brown flocculent sulphide, carrying with it quite a considerable quantity of free sulphur.

In a second series of two experiments, in each of which there was the same amount of palladium as in the previous trials, the quantity of ammonium hydroxide in excess was made 30 cc., while the current (giving 0·8 cc. oxyhydrogen gas per minute) was allowed to act for sixteen hours. The results were quite concordant:

EXPERIMENT III.

Weight of silvered dish + Pd = 72·1055
" " " — Pd = 71·8825
Weight Pd = 0·2230 grm

EXPERIMENT IV.

Weight of silvered dish + Pd = 62 0512
" " " — Pd = 61·8280
Weight Pd = 0 2232

It may be remarked that in filling the silvered platinum dishes a rather large surface of silver was allowed to remain above the electrolyzed liquid, so that by merely adding water it was possible to ascertain when the palladium was fully precipitated. When the deposition was not finished the new silver surface soon showed streaks of metal.

A third series of two experiments, in which the added amount of palladium was double that recorded in the preceding examples, the same conditions were observed as before, with the exception that as the current was only giving 0·70 cc. oxyhydrogen gas per minute, the time of precipitation was extended to eighteen hours. The results were as follows:

EXPERIMENT V.

Weight of silvered dish + Pd = 72·3555
" " " — Pd = 71·9100
Weight Pd = 0 4455

EXPERIMENT VI.

Weight of silvered dish + Pd = 62 2600
" " " — Pd = 61·8138
Weight Pd = 0·4462

* Paper read before the Chemical Section of the Franklin Institute, March 18, 1890.

‡ Berg-und Hüttenmännische Zeitung, **38**, 121; also, Zeit. für anal. Chem., **22**, 240.

Curiously enough, upon warming the liquid poured off from the palladium in Experiment V, with ammonium sulphide there appeared a very slight sulphide precipitate after some hours. The liquid from Experiment VI showed no trace of unprecipitated metal.

The deposits in the experiments just recorded were bright, metallic, and very dense. In none was there the slightest tendency to sponginess. To show the accuracy of the method, the results may be tabulated as follows :—

Experiment.	Found Pd.	Calculated Pd.
I, ...	0·2225	0·2228
II, ...	0·2225	0·2228
III, ...	0·2230	0·2228
IV, ...	0·2232	0·2228
V, ...	0.4455	0·4456
VI, ...	0·4462	0·4456

If the percentage differences be calculated, it will be found that they are quite within the limit of error occurring in almost any ordinary gravimetric determination.

The behaviour of ammoniacal palladium solutions, when exposed to the action of the electric current, will be further studied as time permits, and, if possible, the attempt will be made to re-determine the atomic weight of the metal by this method in a somewhat modified form.

WHITE-LEAD AND ITS INVENTORS.

SPECIALLY CONTRIBUTED.

WHITE-LEAD stands unique among pigments, alike in the greater variety and the extent of its uses and in the many efforts which have been made to supersede it with newer and cheaper pigments with very varying success, but without any appreciable influence on the quantity of white lead in use. No other pigment has attracted the attention of inventors to the same extent, nor has any other pigment yielded the Patent Office such a revenue for patents; and yet to-day the manufacture of white-lead is conducted in very much the same manner as it was—say fifty years ago. For some occult reason or other, the many so-called improvements which have been patented from time to time seem to have been found, when tried practically on the large scale, to be no improvements at all, and have in consequence been allowed to die a natural death.

It has been considered worth while, having in view the great interest that white-lead possesses for painters and patentees, to notice briefly and yet clearly all the patents which have been taken out concerning this pigment, and to point out as far as possible all the leading points of these and to show wherein they fail to give satisfactory results; this is done in the anticipation that it will show would-be inventors what has been done in the past and at the same time what to avoid.

It may be convenient before passing on to a detailed notice of the white-lead patents to point out what white-lead is. This very important pigment is what chemists call a basic carbonate of lead, *i.e.*, there is more of the base present than is necessary to combine with the carbonic acid present to form carbonate of lead, $PbCO_3$. This extra base is present in the form of hydroxide PbH_2O_2. Now in the pigment each of these two bodies has its particular uses; the carbonate gives the lead its whiteness and opacity, and therefore its covering power or body; the hydroxide has the property of combining with the oil used, forming a kind of varnish, which enables it, so to speak, to hold the carbonate in more perfect suspension in the paint, and to flow more freely from the brush. It also adds to the covering power of the pigment by its amorphous form. It is a well-known fact that those pigments which have the greatest covering power are those that have no definite form, or are amorphous; bodies like barytes, which are more or less crystalline have no great covering power simply because they are generally somewhat transparent and no amount of grinding will deprive them of this transparency. Now lead hydroxide is perfectly amorphous so that it has considerable covering power; further, its presence in the white-lead induces the carbonate to assume this form, and so causes it to have more covering power. Now it has been shown repeatedly by various chemists who have analysed white-lead, that in the very best leads the two bodies are combined in the ratio of three molecules of carbonate $PbCO_3$, and one molecule of hydroxide PbH_2O_2, and that therefore white-lead is represented by the formula $2\,PbCO_3$, PbH_2O_2. It contains, therefore,

Lead monoxide, PbO	86·32 per cent.
Carbonic acid, CO_2	11·36 ,, ,,
Water, H_2O	2·32 ,, ,,
	100·00

If any sample of white-lead varies very much from these figures in its composition, it is sure to be defective in some way. An increase in carbonate increases its tendency to assume a crystalline form, and hence reduce its covering power; on the other hand, an excess of hydroxide affects the colour, causing it to become more yellow, which is undesirable. It is therefore a matter of importance in all processes for the manufacture of white-lead, to obtain as near an approximation to the composition indicated by the formula $2PbCO_3Pb\,H_2O_2$ as possible, and it is of equal importance to know the exact conditions of temperature, humidity, etc., under which the result can be attained. Later on, more will be said on this point.

The earliest patent relating to white-lead is one granted to Christopher Eland on October 5th, 1622. At that time, patents were granted not only for the making, but the sale of articles, and patentees were not required to specifically describe their invention, they paid their money and got their patent. Whether Christopher Eland made any improvements in making white-lead is uncertain, the patent is for "makinge white and redd-leade, as it is now made for painters;" evidently, what Eland paid for and got was a monopoly of its sale in England, and we presume the Treasury got a good round sum in consideration thereof.

Since then, there have been numberlesss patents granted for improvements (?) in making white-lead, many of these are simply repetitions of one another, and it is astonishing that patentees have not made themselves better acquainted with all that had been previously patented, and then they would not have wasted any money on Patent Office fees. Some of the patentees have evidently rushed into the business and have possessed but little knowledge of it, while others are evidently quite familiar with it and know what the novel features of their processes are. It will make it clearer if an attempt at classifying the various processes be made, it will only be an attempt, for it is very difficult to strictly divide the various processes that have been used into groups, for they run very much one into the other.

1st. *Stack Methods.* In these, blue lead is made into a stack with vinegar, dung, and other materials.

This is the oldest method and very little alteration seems to have been made during the past hundred years in it.

Prior to 1787 dung appears to have been the fermenting medium but in that year Fishwick patented the use of spent tan as communicating a more uniform heat. Grace, in 1800, proposed the use of spent grapes, or raisins, or spent hops, for the purpose, whether his proposition took root history is silent. In building the stack the usual plan is to place a layer of dung or tan, then a layer of earthen pots containing vinegar, and a roll of lead, then some cast lead gratings, covering over with planks, repeating these layers until the stack is filled. In 1809, Brierley proposed a new arrangement, he placed a layer of tan, on this a layer of pots with acid, then a layer of boards, these had holes in them corresponding to the pots, over the holes were placed lead rolls, then a number of boards were placed edgeways and formed a support for a layer of boards on which a layer of tan was spread, then the series was repeated, it is very doubtful whether this new method, which is certainly more troublesome, is any improvement on the old one.

Ham in 1826 proceeds on a different principle, he realises that the temperature is a very important item in the Dutch process by causing the vinegar to vapourise and attack the lead, and so he makes his chamber water-tight at the bottom, puts in the tan, on this the lead, but not in pots which cannot be considered satisfactory and there is no doubt was discontinued in practice, then he pours vinegar into the bottom of the chamber and vapourises it by steam pipes.

This was a step in advance but the improvement was not of sufficient moment to secure it a long life. For 30 years the Dutch process remained in statu quo, then in 1860 Baker, instead of using acetic acid, used mixtures of acetates and sulphuric acid, a very doubtful improvement. Since then nothing has been done, and the old Dutch process is still used in precisely the same condition to-day as when Fishwick substituted spent tan for dung, over one hundred years ago.

(To be continued.)

MANGANESE PLATING OF IRON AS A PROTECTION FROM RUST.—According to our Italian contemporary, *Progresso*, articles of iron can be protected against rust by sinking them near the negative pole of an electric bath composed of 10 litres of water, 50 grammes of chloride of manganese, and 200 grammes of nitrate of ammonia. Under the influence of the current the bath deposits on the articles a film of metallic manganese which prevents them from rusting.

THE TRADE IN OTTO OF ROSES.—The British Vice-Consul at Philippopolis, in his last report, says that it is estimated that during the past year about 620,000 "miskals," equal to 6,594 lb. of otto roses were exported, the price being calculated at 1¾d. per degree per "miskal," and Kezanlikotto varying from 13 degrees to 16 degrees. The value exported would therefore be about £62,000. The price is 12½ per cent. below that of former years, the trade is suffering from Turkish and other competition, and from the distrust caused by adulteration, for which purpose the essence of geranium is chiefly employed. The Government have forbidden the importation of this essence, but it continues to be smuggled into the province.

THE EMPLOYMENT OF HEAVY NAPHTHA OILS FOR LIGHTING PURPOSES.

A PAPER was recently read by K. Lissenko before the Imperial Russian Technical Association, in which the author strongly recommended the general employment of heavy naphtha oils for lighting purposes. This paper is published in the first instance in the *Bull. Soc. Impér. Poly. Russie*, 1890, vol. XXIV., p. 4.

The author contributes some interesting information which we may briefly glance at.

As much as twelve years ago various engineers pointed out that the naphtha obtained from the Balkan district differs considerably from that which is found in Pennsylvania, U.S.; thus only about 37 per cent. of kerosene is obtainable from the Caucasian naphtha, while the Americans succeed in getting as much as 70 per cent from theirs.

The main object of the oil owners since the opening of the Baku industry has been to obtain from Apsheron naphtha a product resembling American kerosene as nearly as possible, and so prevent the latter from flooding the Russian markets. The Baku owners have been blamed for this by some authorities, it being thought that they ought to work out a special grade of oil, but competition necessitates the production of an oil that cannot be distinguished by the consumer from American kerosene.

The object at present aimed at in the Russian refineries is to obtain 37 per cent. of kerosene and 50–55 per cent. of naphtha residuum, which substance is much used along the Volga for fuel. This residuum is now so important that it can no longer be regarded as a mere bye-product, and hence naphtha has become a heating as well as a lighting material. Up till 1878 the naphtha residuum was often procurable for ½ kop. per pud, but now it fetches 4 kops. per pud.

The question is not yet decided as to whether this method of treatment is the most advantageous; for 12 per cent. of oil can be got by simple distillation from the residuum. These oils are heavier than kerosene, but nevertheless they will burn in lamps. They are the so-called "solar oils," or heavy naphtha oils, and Lissenko proposes to introduce them into general consumption as a substitute for kerosene.

These heavy oils possess certain advantages, one of the most important of which is that since they have a high flashing point they are very safe. Lissenko recommends that they be separated from the residuum because he considers that to employ naphtha for lighting purposes is the most suitable use to which it can be put, and as for the employment of naptha for heating purposes, that has already reached such a pitch of development in Russia that there is no danger of its ever being abandoned.

Lissenko considers that fractional distillation from heavy naphtha constituents is too slow for commercial requirements, and that an intermediate or "solar" oil should be obtained by ordinary distillation, this oil being intermediate between kerosene and lubricating oils.

One of the chief reasons for not utilizing this oil hitherto has been the want of a suitable lamp, and then the difficulties and expense of refining have been alleged.

As regards the lamp question, Kumberg obtained a prize for a suitable lamp a few years ago, but his lamp has not been generally adopted. Since then (1883) several cheap lamps have been invented, and this has caused Lissenko to redirect his attention to the application of solar oil for lighting purposes. Last autumn a lamp was introduced by Voislar, which is said to burn the oil well, and another has since been invented by Bluman. If the oil came into general use little deficiencies in the construction of the lamps would soon be eliminated.

The chief difficulty undoubtedly lies in the trouble of purification, which renders the "solar" oil as yet more expensive than kerosene, and although it has the advantage of greater safety this does not make up for the difference in price. The duty on "solar" oil is 30 kops., that on kerosene 40 kops.; but this difference is more than swallowed up by the cost of refining.

From a number of experiments made by the author he has been led to the conclusion that the cost of the refining depends upon the standard adopted.

As there are so many grounds which make the general introduction of the heavy oils advisable, for example, their greater safety and the more economical exploitation of the naphtha which would result, and as the cost of refining cannot, as far as can be seen at present, be much reduced, Lissenko submits the following proposals:—

1. That the Ministry of France be requested to make an alteration in the duty upon the various oils of such a kind that those hitherto rated at from 40–50 kops. should be further rated at from 20–30 kops.

2. That the latter should be died red, and that the employment of the dye should be understood as guaranteeing a sufficient degree of purity.

These proposals, he considers, would, if carried out, lead to the general employment of the heavy oils for lighting purposes.—*Oil and Colourman's Journal.*

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Buckley.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

Chadderton Iron Works Co., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, Plaistow, Essex.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

Galloways, Limited, Manchester.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co. Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters

Joseph Kershaw and Co., Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Meldrum Bros., Manchester.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.—Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

A METHOD FOR RENDERING BASIC ANILINE COLOURS SOLUBLE IN BENZENE, CARBON DISULPHIDE, ETC.

BY M. JULES PERSOZ.

THE processes which have hitherto been employed for the purpose of rendering basic aniline colours soluble in benzene are based upon treatment of the colour with resin soaps.

Another method, which I have used for more than a year for certain blues intended for a special industrial purpose, permits of the use of oleic acid and similar substances, or of ordinary soap. Two ways of effecting the desired change are open:

1. To commence by isolating the free base of the colour, and, after drying it, dissolve it in commercial oleic acid in the presence of alcohol, which is subsequently distilled off. The mass left behind is the oleate of the base and is soluble in benzene.

2. To make use of a double decomposition by heating the colouring matter with an aqueous solution of Marseilles soap. The acid of the colouring matter combines with the sodium of the soap, while the fatty acids of the latter unite with the base of the colouring matter.

I have found the second of these methods to be the most convenient in practice. When the colouring matters to be treated are insoluble or only slightly soluble in water it may be useful to grind them up with a little alcohol before mixing them with the soap solution. When the colours are soluble, as for example methyline blue, this precaution becomes unnecessary; but in any case it is well to thoroughly mix the colour with water.

The preparation of a methyline blue, soluble in benzene, may serve to show how the process is carried out.

Four litres of distilled water, 32 grammes of white Marseilles soap, dried in the air, and 32 grammes of methyline blue are required.

The soap is dissolved in part of the water and the colour ground up with the rest of it in a mortar. The two are then mixed in the cold and the mixture heated to the boiling point for at least half-an-hour in a water bath, a more or less abundant lather being formed on the surface of the liquid. The vessel is then removed from the water bath and allowed to cool. On the next day, the blue is found suspended in the liquid as an insolulable precipitate and is filtered off through a piece of linen.

The separation of the colour is so complete that the liquid which passes through is only very slightly coloured. The precipitate is allowed to dry in the air and can, if desired, be fused in the water bath. Its fluidity may be increased by the addition of a small quantity of oleic acid, and it can then be more easily run off into any vessel.

The yield in this particular case is about 48 grammes, the equivalent of the fatty acids which have combined with the colouring base being much greater than that of the mineral acid which they have replaced.

Each colouring matter has its special peculiarities, and the treatment must accordingly be modified to suit each special case. It happens, for example, in the case of light blue, that the colour remains partially dissolved in the soap solution. In order to separate it, it is only requisite to add a little hydrochloric acid to the solution. The colour thus thrown down is completely soluble in benzene. The separation by filtration or precipitation may be altogether avoided by evaporating the entire product to dryness in the water bath.

The residue of sodium salts and the excess of soap does not prevent the colouring matter from dissolving in benzene when the mass is extracted with the solvent.

It is worthy of notice that the oleates formed by basic colours may be heated without danger of decomposition to 100°, either dry or in the presence of water, whilst their solutions in benzene cannot usually be heated to a temperature some degrees below the boiling point of the lather without decomposing. In the case of light blue, for example, the benzene solution is decolourised by heat, and only takes up a small part of the colour on cooling. Hence it becomes necessary to make the solution in the cold, grinding the oleate up with the benzene in a mortar. Induline blue does not behave in this manner. Its solution may be heated without fear of decomposition, and the following simple experiment may be performed with it:—

When a little of the blue is placed in a test tube together with some water, some soap, and a little benzene, it will be observed that on heating the layer of benzene which floats at the top becomes coloured blue, and may even attain a very deep shade.

There is no doubt that in these preparations oleic acid can be replaced by other acids, either free or as alkaline soaps. I do not, however, think it necessary to dwell on this point. The action of soap on basic colouring matters, and the solubility of their oleates in this reagent, explain why many colours when fixed without mordants, as for example, on wool, cannot withstand washing, especially in hot water.—*Le Moniteur de la Teinture.*

DELTA METAL.

ACCORDING to *Glaser's Annalen*, delta metal is a very old alloy, having been known to the old Egyptians. It was first prepared, however, in a scientific manner by Alexander Dick, a German, in 1882. This metal is an alloy of copper, iron and zinc, resembling aich-metal and sterro-metal, which contain the same elements, and are largely used for heavy guns.

The delta metal is prepared by taking advantage of the fact that melted zinc will dissolve about 9% of its weight of iron. The saturation point of the zinc depends upon the temperature of metals during the process—the higher the temperature the greater the amount of iron absorbed. At a white heat nearly 20% is taken up. The fluid alloy is then mixed with an amount of copper or copper and tin, which varies according to the purpose for which the metal is intended. The oxides present are removed by the addition of a small quantity of manganese, usually in the form of copper-manganese alloy.

This metal is tough like wrought iron and has a golden colour; it can be drawn into wire and rolled either hot or cold. At a dark-red heat it is easily welded and stamped, by which process it is said to become 50% stronger than wrought iron. When melted it is very fluid and can be easily cast, the castings being uniformly dense and showing a fine crystalline fracture on being broken. The melting point is 1·750° F. and the specific gravity is 8·6. It is said to be less affected by the air than phosphor bronze, brass or red bronze. One of its leading excellencies is that it perfectly withstands the action of salt water.—*Kuhlow.*

MANUFACTURE OF WOOD PULP IN FRANCE.

THE British Vice-Consul at Dieppe says that at Bonne-Nouvelle, near the new docks, there is a mill for the manufacture of wood pulp for paper making. The pulp is sold to paper mills in France, and mostly used, together with rags, for the manufacture of various kinds of paper—from wrapping paper to superfine writing paper—but this pulp is so far different from others in the market, that not only can good printing paper, but also a high class of writing paper, and other superior kinds of paper be manufactured out of it without the addition of rags, and the samples of writing paper have very much the appearance of paper made of linen rags. The manufacture is a very simple one. The wood is the usual white wood from Sweden and Norway, or Finland, as no suitable wood can be supplied in large quantities from the neighbourhood. It is shipped in round timbers of from two to six feet in length, and three to twelve inches in diameter. The first operation is to remove the bark and clean the outside of the wood, which is done by women, and it has been found that women are more suitable for this work than men. Afterwards the round logs are cut into flat pieces of about 2½ inches in thickness. The knots are now, as far as possible, bored out by machinery, but any remaining knots are cut out by hand. Great attention is paid to cleaning the wood in order to obtain a pulp clean enough for good kinds of paper. The cleaned wood is fed into a cutting machine, which rapidly chops it up into pieces of about half an inch in length. A band carries the cut wood to the top of the boiling-house. The boilers are of iron, covered on the inside with lead to protect the iron from the action of the sulphurous acids used. The boilers are filled with wood through an opening of the top, and then a liquid, containing bisulphite of magnesia, is poured in to cover the wood. The boiler is then closed with a cover, and boiling is now done with steam, the time varying from 10 to 12 hours. When the boiling process is finished the steam is blown off, and the pulp forced out through a valve at the bottom of the boiler into a tank with a perforated bottom to allow all liquid to drain off. The incrustating and foreign substances in the wood having been dissolved by the boiling process, the mass is now a soft white pulp, consisting of fibres of wood. After being washed this pulp is ready for paper making, and for facility of transport is formed by machinery into rolls of a kind of rough, thick paper, which are forwarded to the paper mills, and contain about 50 per cent. of water. The process used is known as Ekman's sulphite process, and is patented in France, England, and other countries. The chemicals—a solution of bisulphite of magnesia—are prepared by leading the gases from burning sulphur over magnesite, water being admitted at the same time. The magnesite (carbonate of magnesia) is a kind of stone which is found in large quantities in Greece, and imported from there. The sulphur comes from Sicily. The mill is at present worked on a small scale, turning out only about 100 tons of pulp per month, but being situated near the new docks, it is advantageously placed for the import of wood, sulphur, and magnesite; and with cheap labour it is likely that it will be enlarged, and that this new industry will become of some importance to the trade of the town.

THE COLOURING OF METALS.

In a recent issue of *The Zeitschrift des Vereines Deutscher Ingenieure*, Herr S. Stein gives the results of some experiments relating to the colouring of metals when annealing, which he shows is due to oxidation of their surfaces. In these experiments pieces of iron and steel were carefully cleaned with alcohol and ether, and put into a glass tube; the air was exhausted and replaced with pure nitrogen, which also was pumped out in order to secure a thorough removal of the oxygen. The tube was then gradually heated, and as hydrogen and nitrogen generated from the metals they were pumped out. The inner surface of the tube, on its cooler parts, became covered with a white precipitate of a still unknown nature. The whole scale of the temperatures appropriate for the appearance of the annealing colours were tried, but these failed to appear, whereas they were called forth immediately on the admission into the tube of air with oxygen. Herren R. Schwirkus and F. v. Lichtenstein have demonstrated in an experimental way that an increasing hardness of the steel necessitates an increasing heating to produce the same annealing colour, and that the composition of the steel affects the conditions for the appearance of the different colours in a still higher degree than the hardness. The combinations of temperatures and colours in the ordinary methods are thus entitled to only conditional correctness at best. Another series of experiments relating to the influence on the colours of the duration of the heating manifested that they can appear at even very low temperatures if they are only kept up long enough, and that the difference between hard and soft steel asserts itself here too. A soft piece exposed during several days to the heat of 177° C. showed purple after 68 hours, violet after 93, and dark blue after 120, whereas a glass-hard piece turned light yellow after 20½ hours, dark yellow after 27, orange after 50, and purple after 103. At higher temperatures the colours appeared with shorter intervals.

THE SULPHATED OIL PROCESS IN DYEING.

THIIS article treats of the conditions necessary for successful application of the "Sulphated Oil Process" in dyeing cotton with alizarine red. All recipes for preparing the oil agree in requiring the sulphuric acid to be added very slowly to the oil and with constant stirring, in order to avoid heating during the mixing and the evolution of sulphurous acid in any large quantity. The author describes experiments which demonstrate that the risk of spoiling the product is much less than is commonly supposed. He shows that at temperatures below 70° any evolution of sulphurous acid must be due to albuminoid substances present as impurities in the oil, the oil itself not giving rise to sulphurous acid below that temperature. (The paper is practically confined to the treatment of castor oil, as that is the only one in common use in Russia for Turkey-red dyeing) The endeavour to avoid any evolution of sulphurous acid may even lead to very imperfect results being obtained, for a low temperature of reaction will leave much of the oil undecomposed—the authors view being that only the fatty acid is of use in the dyeing process. In working on the large scale with 1,000 kilos. of caster oil the author adopts the following procedure: In winter 20 to 30 per cent., and in summer 15 to 20 per cent. of concentrated sulphuric acid are used. About one half of the acid is stirred into the oil during 9 hours of the working day and the mixture is allowed to stand overnight. On the next day the second half of the acid is stirred in and the mixture allowed to stand until a sample gives a clear solution when diluted with water in a test-tube. The bulk is then mixed with an equal weight of water. It is necessary to test a sample frequently, as the mixture will give a cloudy solution in water if either too short or too long a time be given for the reaction. The proportion of free fatty acid may be increased if desired by using hot water for dilution. On allowing the mixture to stand, the oily part separates and floats on the aqueous acid layer, and it is drawn off to be treated with alkali. As some of the best preparations contain only 2 to 5 parts of SO_3 to 100 parts of fatty acids, whereas the sulphonated fatty acid should contain 6 to 15 times more SO_3 it is evident that the sulphonated fatty acid is not of essential importance, and this conclusion is corroborated by an experiment on the large scale in dyeing with fatty acid prepared by saponification with alkali, in which, of course, no sulphonated compound was present; but although the shade produced was very fine, the oil bath showed a tendency to frothing, which caused the dyeing to be somewhat uneven. In order to fit the sulphated castor oil for use as a mordant, it has to be partially neutralized by an alkali, and the author finds that sufficient alkali has been added when it amounts to more than a quarter and less than half that required for theoretical neutralization. In practice the alkali, either caustic soda or ammonia, or both, is added to the emulsified fatty acid until the mixture becomes suddenly clear, when the right degree of neutralization has been obtained. The use of ammonia for neutralization has certain advantages, especially in the finishing and printing of steam colours, because the alkali volatives and leaves only the free fatty acid on the cloth. The reason why castor oil has come to be selected as the most suitable for Turkey red dyeing is its property of forming a soluble soap with a minimum proportion of alkali. Solutions of other fatty acids give emulsions rather than clear solutions when the proportion of alkali falls much below that required for complete neutralization. Again, the decomposition of the oil by the action of sulphuric acid is more complete with castor oil than with any other which can be used, and maximum decomposition is essential to the achievement of the best results. A certain proportion of undecomposed oil has, however, the advantage that it lessens the tendency to frothing, and the decomposition by means of sulpuric acid in the case of castor oil provides for the ready attainment of this condition.—*Kuhlow.*

NEW DYESTUFFS.

MESSRS. Leopold Cassella and Co. are introducing two new dyestuffs of the class of their Diamine colours, dyeing unmordanted cotton in alkaline bath. Both dyestuffs have the advantage of great fastness to light and acids, their fastness to washing being at least equal to the best of the known direct cotton dyes.

Diamine Violet N (patent applied for), a bright violet of great tinctorial power, very suitable as self-colour and in mixtures.

Diamine Fast Red F (patent applied for), producing a red of the shade of bar-wood, deserves special interest as the first really fast red amongst the large number of direct red cotton-dyes.

Messrs. Cassella recommend to dye:— Cotton boiling with addition of Glaubers' salt and soda like their other known Diamine colours; fabrics of wool and cotton mixed, like cotton, both fibres being dyed in one bath to equal depth; wool in neutral or weakly acidulated bath (as mordants may be used Glaubers' salt, common salt, phosphate of soda or acetic acid), the dyeings are very fast to milling and resist the action of sulphurous acid (stoving); silk with the addition of acetic acid (sulphuric acid or soap do not give equally good results); the dyeings are very fast to water; fabrics of silk and cotton mixed in a soap bath. For this purpose the dyestuffs are of special value, as thus the cotton is dyed much deeper than the silk. The latter can therefore be shaded at will with other colouring matters. Diamine Violet N and Diamine fast Red F can be mixed with each other, and with any other direct cotton dyes. In combination with their Diamine Black Ro and Diamine Yellow N, which are equally fast to acids, air, light, and alkalies, an immense number of mixed shades can be produced, which hitherto could not be obtained equally fast in such a simple way. Messrs. Cassella have issued an attractive series of shades of these two dyestuffs mounted on card for the pocket, accompanied by the following directions:—

DIRECTION FOR DYEING 100 KILOS. OF COTTON.

Dye in boiling bath with the addition of
15 kilos. Glaubers' salt,
5 ,, soda crystals.

According to the depth of shade required the duration of the dyeing process has to be regulated. For light shades ½-hour is sufficient, for medium shades about ¾-hour, and for deep ones about 1 hour. When light shades and such of medium depth are dyed, the bath is generally exhausted, while in the case of deep shades a part of the dyestuff (10 to 20%) remains in the bath.

For the shades combined with Diamine Yellow N, marked *, instead of Glaubers' salt and soda crystals use
15 kilos. phosphate of soda and
5 ,, soap.

1 kilo (ko.) = 1,000 grammes (grs.)
1 lb. English = 453 ,,

Copper and Copper Mining Shares.—The firmness of the market for copper and copper mining shares is still a noticeable feature, but this is hardly to be wondered at, considering the statistical position. According to Messrs. H. R. Merton, there has been an increase in the deliveries of 537 tons for the month of August, compared with July, while the total supplies in England and France are now no more than 9,393 tons, against 11,470 tons in the previous month. Stocks have, therefore, declined over 2,000 tons, and now stand at the comparatively low figure of 69,959, as compared with 106,000 tons at this time a year ago. The change in the position for the month is not great, it is true, but, taking into account the small stocks, the outlook appears to be a very satisfactory one for the producer of copper as well as for the holder of copper mining shares. The price of copper has now risen to £61. 5s. od., or about the highest point touched since the collapse of the French syndicate last year; while Rio Tinto mining shares, which fell to about 8, are now quoted about 26.

A TEST FOR PURE TURPENTINE.

THE traffic in mixed turpentine is represented to be growing in importance, and the worst feature about the business is the fact that he compound is sold as pure turpentine but at a cheaper rate, which makes it a constant disturbing element in the market. If the parties who manufacture the sophisticated article would tell the truth about it and brand it properly, there would be no complaint to make, but the desire to realise more than the stuff is worth has evidently influenced the mixers to continue the swindle. The misrepresentation was exposed in these columns last year and it had the effect of discouraging the traffic for a time, as buyers were put on their guard, but the bold game is in full sway again we understand, and measures are again being taken to prevent the manufacture and sale.

Mr. Chas. Richardson, President of the National Paint, Oil, and Varnish Association is entitled to the credit of not only directing the attention of the trade to the fraud when first discovered, but of continuing the agitation. After some investigation of the subject in its new phase, he has discovered a method for detecting foreign matter in turpentine, and through his courtesy we are enabled to present below the valuable result of his labours, which should be cut out and pasted in every office where naval stores are handled :

"The subject of most importance now is the adulteration of turpentine, which is being carried on in a larger proportion than is generally known, and it has surprised me that the receivers of turpentine in the South do not demand a more careful inspection of the article. It may take more time and entitle them to more pay to guard against this fraud, but they would be entitled to further consideration if the work was well done.

In my last letter, I wrote you that the methods adopted by the manufacturer had been changed, resulting in change of gravity of the article manufactured, making it not so easy to detect the fraud by the hydrometer, but from my experiments of late and what I can learn from others who have been investigating this matter very thoroughly, I find that the hydrometer is still the surest method of detecting adulteration.

Below I give you the new method, which is very simple and said to be correct. All parties interested can experiment with this easy method and will be satisfied with results. A gentleman from the South writes me that it is a simple, practical, mechanical test. It is as follows :

Drop on a clean glass surface one drop of pure spirits turpentine ; near it put a drop of the suspected article, and with the light properly reflected from the surface, watch the effect as it evaporates. If pure the drop will dry off almost like water and no colour be reflected from the surface. If the drop contains as much as 5 per cent. of oil or benzine, the surface, with the light properly thrown on it, will exhibit an iridescent purple, similar to that thrown off from the surface of water on which oil has been dropped.

Should this prove to be of service to those who are in sympathy with the movement to stamp out adulterated turpentine being sold as pure, I have accomplished my purpose."—*Oil, Paint, and Drug Reporter.*

THE MANUFACTURE OF HYDROGEN DIOXIDE.

By A. Bourgougnon.

IN 1878 I manufactured hydrogen dioxide on a commercial scale, and the following is a description of the method I adopted for the preparation of this bleaching compound :—

The first step, and a very important one, is the hydration of the barium dioxide. Into a suitable vessel—an ordinary cylindrical stone pot, about half full of water—the powdered dioxide is slowly poured, the mixture being well stirred with a wooden spatula during this operation, and continued after its completion for about twenty minutes. Then the mixture is left alone, and stirred every half-hour or oftener for about ten minutes, until the hydration is completed. This operation requires from three to four hours ; the barium dioxide forms then a thick, perfectly white and smooth, pasty mass, resembling white clay mixed with water.

While the hydration is progressing, a mixture of water and hydrofluoric acid is made in a vessel lined with sheet lead, and surrounded with ice, or simply with water in which lumps of ice are placed from time to time, so as not to allow the temperature of the acid mixture to rise above 10°C during the operation.

All things being properly disposed, the hydrated barium dioxide is added in portions of three to four pounds at a time to the acid mixture, stirring all the time to mix the contents of the vessel thoroughly. All the barium is transferred to the acidulated water. in about two hours, and the agitation continued for four hours. If the operation has been well conducted, all the barium dioxide is transformed into fluoride, which falls to the bottom of the vessel. When this precipitate is well settled, the supernatant liquid is decanted into a vessel similar to the one used for its production, and also surrounded by ice-water. The clear liquid contains an excess of acid and impurities derived from the materials employed ; its colour is yellowish, and it must be purified to ensure its keeping properties.

The impurities which are to be removed are chiefly ferric oxide, alumina, and manganese oxide. To the cold solution of impure hydrogen dioxide, small quantities of hydrated barium dioxide are added at a time and well stirred. When the last traces of acid are saturated, the appearance of the liquid suddenly changes, from a bright yellow it turns to a greyish colour, and the impurities are separated and collected at the surface of the liquid.

Without losing time, the liquid is filtered through a cheese-cloth stretched on a frame, and received in a vessel which contains a small quantity of sulphuric acid diluted with eight to ten times its volume of water (acid, 1 oz. ; water, 8 to 10 oz.). This filtration must be quickly done. As long as the solution is alkaline, there is great danger of decomposition and loss of oxygen. If the liquid is thrown upon the filter, the latter will be quickly clogged, the filtration stopped, and the hydrogen dioxide will rapidly decompose, emitting large bubbles of oxygen with a hissing noise ; but as the precipitated impurities collect first on the top of the liquid, if the solution is syphoned from below these impurities, the liquid filters quickly and satisfactorily.

The filtered liquid is tested for barium, and sulphuric acid is added to it until all is removed. The liquid is left over-night, the precipitate of barium sulphate settles, and the perfectly clear and colourless liquid is ready for the market.

All the precipitates are separated by pressure from the liquid they may contain, and the liquid so obtained is added to the water employed in the next operation.

I employed the following proportions :—

Barium dioxide	60 lbs.
Hydrofluoric acid	25 ,,
Water	40 gallons

and obtained nearly 40 gallons of hydrogen dioxide. The strength of the acid was about 33 per cent.—*Journal of the American Chemical Society.*

Proposed Extension of the Waste Bleaching Trade.—We are informed that Mr. John Mitchell, cotton waste bleacher, Townsendfold, has entered into possession of Hawthorn mill, near Cloughfold railway station, Lancashire, and that it is being fitted up for the cotton waste bleaching business.

Celluloid.—The Eastman Photographic Materials Company prepare their sheet-celluloid as follows : 9,000 grains of pyroxylin or nitrocellulose and 5,400 grains of camphor are dissolved in 112 ounces of methylated spirit and 28 ounces of fousel oil, 7 ounces of amyl-acetate added, and a gentle heat applied. Glass plates are coated with a solution of yellow wax in benzol and polished, and then washed with water, to which about 2 or 3 per cent. of silicate of potash or soda is added. The whole is allowed to dry, and the solution of pyroxylin is coated on the plate and allowed to dry. A coat of sensitive emulsion is then applied, and, when this is dry, the whole is stripped. The thickness of the celluloid film is from $\frac{3}{1000}$ to $\frac{5}{1000}$ of an inch.

Shrinkage of Castings.—In locomotive cylinder, one-tenth of an inch in a foot ; pipes, one-third of an inch in a foot ; girders, beams, etc., one-third of an inch in fifteen inches ; engine beams, connecting rods, etc., one-third of an inch in sixteen inches ; large cylinders, say seventy inches diameter, ten feet stroke, the contraction of diameter, three eighths of an inch at top ; ditto, one-half inch at bottom ; ditto, in length, one-third of an inch in sixteen inches ; thin brass, one-third of an inch in eight inches ; thick brass, one-third of an inch in ten inches ; zinc, five sixteenths of an inch in a foot ; lead, the same ; copper, three-sixteenths of an inch in a foot ; bismuth, five-thirty-seconds of an inch in a foot ; tin, one-quarter of an inch in a foot.

Composition of American Natural Gas.—The following results of analyses of nine different natural gas borings, are of interest as showing the general average composition of natural gas, and as explaining some of its thermal effects.

	Per cent.						
	N.	CO_2.	H.	NH_3.	O.	H_2S.	Paraffins.
Highest	15·30	0·44	0·02	Tr.	Tr.	Tr.	97·70
Lowest	2·02	Tr.	Tr.	Tr.	Tr.	Nil.	84·26
Average	9·10	0·26	Tr.	Tr.	Tr.	Nil.	90·65

The paraffins have the composition by weight :

	Highest.	Lowest.	Average.
Carbon	78·14	74·96	76·64
Hydrogen	25·04	21·86	23·36

and may be considered as consisting chiefly of methane. The olefines are seldom if ever present.

BACK NUMBERS OF THE CHEMICAL TRADE JOURNAL.

NOTICE.

As we shall shortly clear out our stock of odd numbers of the earlier volumes of the Journal, those of our readers who require back numbers, to complete their sets, should apply for the same not later than October 4th. Some of the numbers are out of print.

Correspondence.

ANSWERS TO CORRESPONDENTS.

Tontine.—The patent expired about the end of last year.

B. N. & Co.—Better do as the inspector suggests. Do not attempt to deceive him.

Barcelona.—About three per cent., but it all depends on the oxygen.

R.V.—See page 132, No. 171, and you will find we have replied to your query. We published your initials only, as we have decided to adopt that course in "answers" column.

Celluloid.—To do all you require of us would mean devoting a whole number of the *C.T.J.* to the subject.

W.D.—A practical treatise on starch, etc., by Frankel and Hutter. London: E. and F. N. Spon; and Paper Making by Cross and Bevan, London: E. and F. N. Spon, may suit you. See also back volumes of this journal.

*** We do not hold ourselves responsible for the opinions expressed by our correspondents.*

DRUGGISTS AS ANALYSTS.

(To the Editor of the Chemical Trade Journal.)

Sir,—One word more in answer to "Pharmaceutical Chemist," who says: "Why should we not be allowed to make analyses for the public, if the public prefers to come to us instead of to a Fellow of the Institute of Chemistry."

Just so, and why should not the Fellow of the Institute of Chemistry, or any properly trained chemist, be permitted by law—instead of prevented—to sell poisons and dispense medicines, if he prefers to combine this business with his analytical one?—I am, Sir, yours, etc.,

Hard Lines.

Selected Correspondence.

MOISTURE IN WOOD PULP.

The following letter appears in *The Paper Trade Review.*

Sir,—In your issue of July 18th, "a Chemist" strikes the nail on the head by saying that unity is wanted in estimating moisture in wood pulps—sulphite, soda, and ground. Although from time to time considerable has been written on the subject in England, Germany, and America, yet a good many of these contributions do not bear the stamp of being practical, and some fail to get at the root of the evil altogether. The use of sulphite pulp as a paper making fibre increases daily on both sides of the Atlantic; It is a most important article of commerce, and owing to the also daily increasing competition in the paper trade can no longer be bought on faith as was the case some years ago. Nor are the crude "office boy" tests now-a-days sufficient to decide the disputes constantly arising between buyer and seller on the moisture. It is well-known that great discrepancies are often found where even carefully sampled lots are tested by different chemists in the interests of buyer and seller. Could a uniform method be decided on, it would, no doubt, save much time and money and many hard words; but to be of commercial value the understanding would have to extend to sampling, method of drying and apparatus used, and last, but by no means least, to the method of calculating the result from the figures obtained by the balance. The method of sampling from bales or rolls, the quantity taken for a test, also how the pulp is prepared before drying, are all matters in which different practices obtain, and whfch are very liable to influence the final result. In the actual drying process the kind of drying oven used, whether ventilated by an artificial current of air or not, and how the drying is conducted, are also points of wide divergence, and influencing the final result. Very different methods of calculating are in use, although at first sight it would seem that only one simple arithmetical operation could be applied. It is beyond the scope of this note to dilate on the details of these different points, but suffice it to say that a large experience has convinced the writer that there is far more trouble caused by differences in the method of calculating employed between buyer and seller as to allowances, &c., than anything else, and in this view he is supported by some of the largest importers in New York City. The head of one of the principal firms handling and importing sulphite and soda pulps from Europe, recently said to the writer: "If the method of sampling and drying were stated in the contracts it might be a good thing, but the trouble is not there. The leading paper mill chemists of Europe and America practically use the same method, viz., dry a known weight in a water-jacketted drying oven till constant, thus getting percentages of dry fibre. On this basis they make their calculations, as under different conditions and in different climates *exposure to the atmosphere* becomes delusive. It is in calculating where most of the difference comes in, and that is a matter between buyer and seller." Hoping the matter will be speedily thrashed out.—I am, yours truly,

H. A. Rademacher, C.E.

Bridgeport, Conn, U.S.A., August 20th 1890.

THE COAL-TAR COLOUR INDUSTRY.

The following letter appeared in the *Manchester Guardian* of September 8th:—

Sir,—I have been unfortunately prevented from attending the meetings of the British Association which are now being held at Leeds, but I have read in your to-day's issue with special interest your report of the proceedings of the Chemical Section on Friday last. On this occasion some of our professors are reported to have stated in a discussion that followed the reading of a paper by Dr. W. H. Perkin, F.R.S, on the development of the coal-tar colouring industry, that the blame for the aniline industry having left this country and found a home in Germany is due to English manufacturers neglecting to take advantage of recent chemical discoveries and their want of enterprise in not employing chemists in original research. Now, I emphatically demur to this expression of opinion on the part of some of our professors, as it is entirely contrary to fact. It is calculated to do mischief to our trade, and is only another proof of how little our professors are in touch with our industries. First, it is incorrect that English coal-tar colour manufacturers do not employ original-research chemists. You will find scarcely any works of this kind in this country in which research chemists are not employed. As to the ludicrous statement of our manufacturers not taking advantage of recent discoveries, you may depend upon it that British manufacturers would only be too ready to take advantage of anything that would assist them in developing their business if they only had the chance of doing so. The fact is that these "recent discoveries," when they are in the slightest degree applicable to industrial purposes, are all protected by patents, often long before the discovery has been brought to maturity or its practicability ascertained by experiment. The authors of these patents are in 95 cases out of 100 in the first instance German professors, then their assistants, and finally their pupils, principally employed in German colour works. These patents are mostly of a very comprehensive, ambiguous, and sweeping character, and the facilities and protection which we grant to foreign patentees are certainly much more favourable that the protection and facilities offered to British patentees when applying for a foreign patent.

Again, where have we to look for and find these original-research chemists? I say principally in Germany. Let us appoint in our colleges and universities as teachers in organic chemistry, men of the very highest knowledge, abitity, and talent, capable of leading the more advanced students into new fields of research, and induce our professors to keep themselves and their pupils in touch with our manufactures and industries, as is done in Germany. Don't have to acknowledge that in order to finish and complete the education of the chemical student, we must send him to the German or Swiss professors. Let us quickly and promptly alter our patent laws and conform to those enacted in Germany, and we shall soon experience a marked improvement in this most important industry. The amendment of our patent laws has been taken up with spirit and energy by the Board of the Manchester Chamber; the education and training of original-research chemists we must leave in the hands of our professors.

In the interest of our coal-tar colour industry it is, however, necessary that I should also refute the statement, made at Leeds, that this industry has left this country, the fact being that the production of coal-tar colours has trebled in this country during the last ten years, and that at least two of the largest works are constantly increasing and extending their plant and machinery. And this progress—I grant by no means satisfactory when compared with the strides that have been made by Germany—has been solely achieved by the enterprise of our manufacturers, notwithstanding the disadvantages under which our industry is labouring. I am glad to say that the Manchester Technical School is setting a very good example in keeping the school, its teachers and more advanced pupils in touch with our industries, by having recently resolved to assist its subscribers and supporters in solving problems which may be encountered by those engaged in the arts of dyeing, printing, tinctorial chemistry, etc. Finally, permit me to tell those

gentlemen who are reported to have made these disparaging remarks about the English coal-tar colour industry, that they are doing harm to our trade and commerce, as such statements, unwarranted as they may be, but coming from such scientific authorities, are reported and believed by consumers all over the world.—Yours, &c.,

IVAN LEVINSTEIN.

Buckingham House, Burlington Road, Buxton,
September 6th, 1890.

Analytical Notes.

THE DETERMINATION OF PHOSPHORUS IN IRON.

IN order to obtain the whole of the phosphorus in a state precipitable by molybdate without evaporating down the nitric solution and igniting the residue, Herr Meinecke and Mr. Wood recommend oxidation with chromic acid. They dissolve 4 375 grammes of the metal in a covered vessel in 40 to 50 cubic centimeters of nitric acid at specific gravity 1·3 (if the iron is very manganiferous, 40 cubic centmeters are sufficient). When the solution is completed, 30 cubic centimeters of dilute sulphuric acid are added (1 vol. acid to 1 vol. water), and the liquid is evaporated down to 15 to 20 cubic centimeters. From 2½ to 3 grammes chromic acid in crystals (not more) are then added, and the liquid is boiled for ten minutes to complete the oxidation of the carbon compounds and of the phosphorus acid. It is allowed to cool a little, and water is carefully added. If the evaporation has been carried too far, manganese peroxide may separate out and retain phosphorus, if this happens, the peroxide must be reduced by the addition of oxygenated water. It must be remembered that all samples of oxygenated water met with in commerce contain phosphoric acid in small quantities. Hence, if much of this reagent has to be used, account must be taken of this impurity. The solution contains, in an insoluble state, only a little graphite and silica; it is made up to 250 cubic centimeters, filtered through a dry filter, and 100 cubic centimeters are taken by means of a pipette. The acid is partially neutralized by means of ammonia, heated to 85 to 90 degrees, and 50 to 100 cubic centimeters of the molybdic reagent are added. It is convenient to precipitate in a vessel so large that it may be only half full. In this case, by leaning the beaker after the precipitate is settled we may, uncover a part of the bottom. If we then cautiously bring back the beaker to its normal position, that part of the bottom remains free from deposit. If, after the lapse of half an hour, we find that no fresh deposit is formed, we know that the precipitation is completed, and we then draw off the clear supernatant liquid by means of a small syphon. The precipitate is collected on a filter as small as possible, washed at first with an acid solution of ammonium nitrate, then with pure water, and is lastly transformed into molybdenum phosphomolybdate, $P_2O_5Mo_{24}O_{66}$, by a moderate ignition. Each gramme of the product corresponds to one per cent. of phosphorus. Herr von Reiss in the analyses of steels, uses potassium permanganate instead of chromic acid, and obtains satisfactory results. The author has used the same process, slightly modified, with success in the analyses of cast metal rich in carbon. He dissolves 4·375 grammes of the metal in 40 cubic centimeters of nitric acid. If the sample is rich in manganese, there is obtained on the addition of permanganate, an immediate precipitate of peroxide. The results are always satisfactory on operating as follows: To the nitric solution of the metal, there are added 25 cubic centimetres of nitric acid at specific gravity 1·4; then 5 cubic centimetres permanganate at 15 grms. per litre, and the liquid is boiled. After a few minutes a fresh portion of permanganate is added, and then a third under the same conditions. There is then produced a manganic precipitate, which a new and final addition of permanganate increases. The liquid is then boiled for a few minutes longer, cooled quickly, and the oxide is removed by oxygenated water added in small successive proportions. The liquid contains all the phosphorus in the state of a phosphate precipitate by molybdate.—*Revue des Mines.*

QUICK METHODS FOR TESTING TALLOWS AND THEIR SUBSTITUTES.

The *Bulletin de la Société Chimique de Paris*, series 3, vol. ii., page 209, contains a paper by Mons. H. Taffe on some rapid methods for testing tallows and the solid fatty substances which are sometimes offered as substitutes for them.

Ordinary tallow contains various fatty acids which are combined as glycerides, and it is a matter of common observation that these fatty acids are never found free in tallow, except in very minute quantities, owing to either the fact that spontaneous decomposition sets in or to the treatment of the crude fat, whilst hot. Stearic acid, however, which is used so much for the manufacture of candles, is not found in the combined state, but usually occurs free. Mons. Taffe recommends the following process for testing tallow and stearic acid:—Five grammes of the suspected tallow or fatty substance are placed in a large crucible, a small quantity (10 c.c.) of pure olive oil is added and the mixture very gradually warmed. A drop of turmeric solution is now added, and the whole allowed to cool; the mixture is then titrated against caustic soda lye, care being taken to keep it constantly agitated. Any free acid found is reckoned as stearic acid, because the quantities of the other fatty acids likely to be present in a free state would be so small as to be negligible.

The free acid in the olive oil employed for dissolving the fat must now be carefully estimated. The oil is mixed with double its volume of strong alcohol, and then titrated against alkali in the ordinary way. The value of free acid found in 10 c.c. of olive oil must of course be subtracted from the total acid found by the first titration.

DETECTION OF IMPURITIES IN ALCOHOL.

M. E. Mohler, in a note published in *Compte-Rendus* points out that the reagents usually considered the best for detecting impurities in alcohol, viz., sulphuric acid, bisulphite of rosaniline, acetate of aniline and permanganate of potash are only useful within certain limits. He has made experiments with alcohol containing known quantities of the bodies unusually found in it as impurities, which show that sulphuric acid cannot be used to estimate the impurities, and is of use to detect only such of them as give a colour with it. With bisulphite of rosaniline, the reaction obtained will depend much upon the relative proportion of sulphuric acid and bisulphite of sodium in the reagent employed, even pure alcohol being coloured if only a little acid be used, whilst if both the ingredients are present in too large quantity 1-1000 part of ethylic aldehyde cannot be detected. He recommends the use of a solution of the following strength: 30 c. c. of a solution of fuchsine of 1 part in 1,000; 20 c. c. of a solution of sodium bisulphite (34° B.): sulphuric acid 3 c. c.; distilled water 200 parts. It should be used soon after preparation, and in the proportion of 4 c. c. to 10 c. c. of the alcohol to be tested. This solution does not act on alcohols and ether, but will detect various aldehydes rapidly. It will not, however, serve for quantitative estimation, the colouration not being proportional to the impurity present. Acetate of aniline in acid solution is a good reagent for furfurol, as it does not react with other alcohols, aldehydes and ethers. As small a quantity as 1 milligram of furfurol per litre of alcohol can be detected by this reagent used in proper proportions. With regard to permanganate of potassium in acid solution, it was found to be decomposed by paraldehyd, isobutylic aldehyd and isobutylic alcohol, the reduction being proportional to the amount of aldehyd present. It can be used to distinguish ethylic aldehyd and paraldehyd, only the latter instantaneously reducing the permanganate. In the case of aniline reagents, the full intensity of the colouration is developed in half an hour.

WIRE AND ELECTRICITY.—Electrically heated flat irons are now made which are very serviceable. The flat iron is of the usual form, but made hollow. The interior contains a lot of coiled wires, through which the electric current passes and heats the wires red hot. The latter are arranged between protecting sheets of mica and asbestos. You turn a switch, and the flat iron at once heats up ready for use. The street wires supply the electrical current. In the same way all kinds of domestic utensils may be heated, such as cake bakers, meat broilers, coffee pots, etc. Electrical platters for keeping food warm when on the table may be had. Electrical heaters for warming apartments are also made. There is, indeed, no end to the useful applications of wire and electricity (American of course).

Market Reports.

REPORT ON MANURE MATERIAL.

The market continues quiet for all kinds of manure material, buyers being deterred from extensive purchasing by the higher prices demanded by sellers.

Mineral phosphates are very firm in all positions, but without quotable change in price. Florida rock does not come freely on the market, and, so far, shipments have not been sufficiently regular for buyers to depend upon. Hot-air dried Bull River rock is worth 11d., and land rock 10d. per unit, c.i.f., in cargoes to U.K.

Buyers still refuse to follow the advance demanded for River Plate cargoes of bones, and we do not hear of any business. There are more cargoes offering, however, both from River Plate and Mediterranean, and £5. 11s. 3d. would probably be accepted in some quarters if bid. Two cargoes of River Plate bone ash sold to U.K., one at £5. 6s. 3d. and the other at £5. 7s. 6d., on 70%, nett cash, Hamburg terms. Nothing further reported in crushed bones, either on spot or for shipment. After considerable sales of East Indian bone meal, on spot, ex-store, at £5. 15s., the price has been advanced to £5. 17s. 6d.,

but, so far, nothing has been done at the advance. For shipment nothing has been done, but £5. 17s. 6d. must be quoted as nearest value. There have been further sales of good grinding bones, ex-quay Liverpool, at £5. 5s per ton.

The nitrate of soda market continues very strong, 8s 6d. would have to be paid for small due cargoes, and it is doubtful whether 8s. 4½d. would now be accepted for large ones. September-November shipments are worth about 8s. 10½d., ordinary quality. Spot value is 8s. 4½d , ordinary quality, and 8s. 7½d. for refined, and very little of the latter available.

No business reported in dried blood, either home prepared or River Plate; quotations must, therefore, be considered nominally as 10s. 6d. per unit.

Superphosphates firm at 50s. per ton, in bulk, f.o.r. at works.

Kainit 31s. per ton, in cargoes, prompt shipment, up to 32s. 6d. for November-December shipment, in bulk, c.f. and i. to U.K.

MISCELLANEOUS CHEMICAL MARKET.

Under the exceptional heavy demand from all sides, the prices of caustic soda have advanced considerably during the past week. For prompt delivery, 70% is now at £11. to £11. 5s. per ton, f.o b.; 60% at £10.; and cream 60% at £9. 10s. f.o.b. Tyne; 77% is £12. to £12. 5s. nett per ton. Soda ash is also in strong position at 1 5/16d. per deg.; for carbonated ash, 48/52%, and some business has been done over 1891 at 1⅜d. per deg. Soda crystals continue scarce and dear. Bleaching powder has advanced, and there is brisk business doing at £5. 10s per ton on rails, and £6. f.o.b. For 1891 delivery, buyers are readily taking up any lots still to be had at £6. per ton, but there are now only limited quantities to be obtained at this figure. The Committee of the Union are making steady progress towards the completion of the scheme, and those best informed of the movements speak confidentially of a successful issue. One thing at least is tolerably certain, and that is an effective organization which will control the future of the Le Blanc alkali trade. Sulphur continues in brisk demand, and stocks are low; price £4. 2s. 6d. per ton at works. Chlorate of potash very firm at 5d. per lb.; sulphate of copper dearer at £19. to £19. 10s.; and the firmness of the metal market is likely to cause further advance. Potash, caustic and carbonate, continue in brisk demand, and prices are higher. Acetates of lime, brown and grey, are moving off at current rates. Acetic acids quiet. Acetate of soda firm at £16. 15s. Yellow prussiate of potash rather dearer at 9½d. to 9¾d. per lb. Bichromates of potash and soda in strong competition among the various makers, at 3¾d. and 2¾d. per lb. respectively, with discounts from 5% to 10%, according to quantity.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Since Tuesday last, sulphate of ammonia has been done both lower and higher than the then price of £11. 12s. 6d. f.o.b. Leith, within a range of 5s., say from £11. 10s. to £11. 15s. The market is now quiet, and the price stands at £11. 12s. 6d., or a little lower, but some holders are not disposed to part at less than £11. 13s. or £11. 15s., believing that they have only to wait to get that. Glasgow shipment quotation exceeds the Leith by about half-a-crown, but the pressure upon this outlet is now relaxed, if not removed altogether. On the whole, the general chemicals market is a shade easier, although caustic and sulphate of copper are dearer. The demand for bleach has weakened, and, while the deliveries of soda crystals attain a considerable bulk, this activity is due not to new orders, but to old unfulfilled contracts. Bichromates, especially in the home consumption department, are very slack, and chlorate of potash also is easy, and has come down a fraction. In paraffins there is still retained a satisfactory firmness, except, as hitherto, in the burning oil section, some of the smaller makers experiencing the utmost difficulty in placing the residue of their output at the Association limit. Chief prices current are:—Soda crystals, 55s. 6d. net Tyne; alum in lump £5. less 2½%, Glasgow; soda ash, 1⅜d. less 5%, Tyne; caustic soda, white, 76°, £12. 10d., 70/72°, £10. 12s. 6d., 60/62°, £9. 12s. 6d. and cream, 60/62°, £9. all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s, and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1⅜d., less 2½% Tyne; saltcake, 32s. 6d.; borax, English refined, £30., and boracic acid, £37. 10s, net Glasgow; bleaching powder, £5. 2s. 6d. to £5. 7s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5 and 10% to Scotch and English buyers respectively, delivered (export orders, a farthing less, and 8% and 7% (potash and soda) off f.o.b. Glasgow); chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 4½d. to 8s. 6d.; sulphate of ammonia, £11. 12s. 6d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18. 10s. less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3⅝d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less). ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 14,710 bags.

TAR AND AMMONIA PRODUCTS.

The benzol market has given way slightly. Buyers seem to have withdrawn from the market, and prices are in consequence lower. 4s. 1½d. for 90's benzol and 3s. 1½d. for 50/90's are to-day's prices. Solvent naphtha is still in good demand. Creosote is moving off freely at old prices, while in anthracene the high prices asked by producers prevent business. Quotations are 1s. 6d. for 30% A and 1s. 3d. for 30% B. The pitch market remains in the same state as during the last few weeks.

The sulphate of ammonia market is firm, but without much demand. The agent of the Gas Light and Coke Co. has made sales at £11. 15s., and will not now accept less than this figure. In London outside makes there is a fair demand at £11. 13s. 9d. to £11. 15s. In the provinces prices have given way slightly, as buyers do not seem anxious to purchase for prompt delivery, although they would certainly give £11. 15s. for October-December delivery. £11. 12s. 6d. may be stated as to-day's price at Hull. The Leith market is quiet, and the price paid is £11. 11s. 3d. Some makes, however, have been offering at £11. 10s, but these are not of the best quality. As makers strongly maintain their prices and will not give way, the outlook on the whole is healthy, especially on the eve of a greater production.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron: Scotch warrants closed at 49s. 11d. cash, and 50s. 2d. one month. Settlement prices:—Scotch, 49s 11d.; Middlesbrough, 47s.; hematite, 57s. 6d. Copper easier, Chili bars, G.O.B.'s and G.M.B.'s closed at £60. 17s. 6d. to £61. 5s. cash, and £60. 17s. 6d. to £61. 5s. three months. Tin dearer: Straits closed at £98. 2s. 6d. to £98. 12s. 6d. cash, and £98. 2s. 6d. to £98. 12s. 6d. three months. Lead firm: Spanish, £13. 5s.; English £13. 7s. 6d. Spelter, Silesian ordinary, £24. 5s. Quicksilver, £10. 10s. first hands, £10. 7s. second hands. In copper shares, Mason and Barry rose 1/8 to 9 5/16, and Tharsis 1/16 to 6 5/16, but Rio Tinto and Cape Copper fell 1/16 each to 26 5/16 and 5 5/16 respectively, and Copiapo 1/16 to 3 7/16.

GLASGOW, Wednesday.—In the pig-iron market to-day Scotch was done in the forenoon at 49s. 8½d., 49s. 9d., and 49s. 6½d. cash and 49s. 11½d. and 49s. 9½d. one month; closing buyers 49s. 6d. cash and 49s. 9d. one month; sellers 49s. 7d. cash and 49s. 9½d. one month. Cleveland closed buyers 46s. 9d. cash; sellers 3d. per ton more. Hematite business was done at 57s. 2d., 57s. 4½d., and 57s. 7d. fourteen days, 57s. 7d. one month; closing buyers 57s. 4d. cash and 57s. 7d. one month, sellers 1d. per ton more. In the afternoon Scotch was done at 49s. 7½d., 49s. 11½d., and 49s. 11d. cash, and 49s. 9½d, 50s. 2½d., and 50s. 2d. one month; closing buyers 49s. 11d. cash and 50s. 1½d. one month, sellers ½d. per ton more. Cleveland was done at 47s. 3d. 23 days; closing buyers 47s. cash, sellers 2d. per ton more. Hematite was done at 56s. 6d. and 57s. 8d. cash, and 57s. 7½d. and 57s. 9d. one month; closing buyers 57s. 6d. cash and 57s. 8d. one month, sellers 1d. per ton more. Settlement prices.—Scotch, 49s. 10½d.; Cleveland 47s.; hematite, 57s. 6d.

WOLVERHAMPTON, Wednesday.—On 'Change this afternoon there was a continuance of the feeling of confidence by which business has lately been characterised. It was stated that there was a fair amount of work in hand at the blast furnaces and mills and forges, and that the autumn shipping demand was opening in an encouraging manner. The trade outlook is improved by the revival of shipbuilding on the Clyde at a time when work in that industry was becoming scarce; and also by the large requirements of the leading railway companies for permanent way material and rolling stock. A steady business is passing in pig iron, and sellers are increasingly firm when forward business is negotiated. All-mine cold blast is £5., all-mine hot blast 70s., part mines 47s. 6d. to 50s., and cinder sorts 43s. 6d. to 45s. Midland sorts are in good demand at 50s. to 52s. 6d. for Northamptons, and 51s. 6d. to 53s. 6d. for Derbyshires. In the manufactured iron trade best bars are in steady outturn at £8. 10s., and common sorts are also active at £6. 15s. upwards. Sheets for galvanising purposes are quoted £7. 5s. to £7. 10s. for singles, and £7. 15s. to £8. for doubles, with a better demand than of late.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market has continued steady during the past week. Bleaching powder has been much stiffer, and prices have advanced from 2s. 6d to 5s. per ton. Caustic soda also is again dearer by 10s. per ton, and market to-day closes very strong. Soda crystals, soda ash, and sulphate of soda remain steady in price, with no appreciable change to report.

Although the original date fixed for the transfer of the chemical works to the "Chemical Union," has been deferred for another month, makers still quote combination prices for October delivery.

For prompt shipment to-day's quotations are:—Bleaching powder, £5. 5s. to £5. 10s. per ton; according to brand; caustic soda, 77%, £11. 10s. per ton; ground and packed in 3-4 cwt. barrels, £14. 10s. per ton; soda ash, 48/52%, 1⅜d. per degree less 5%; soda crystals, 55s. to 56s. per ton; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 41s. to 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

There is no change to report in coals for manufacturing purposes. The demand is steady, and prices are fully maintained. Quotations for Northumberland steam small range from 7s. to 7s. 6d. per ton, and Durham small 8s. to 8s. 6d. per ton.

The following are the exports of chemicals from the Tyne for the month of August and corresponding period of previous year:—

	1890.	1889.
Alkali and Soda Ash.....	1,538 tons	1,102 tons
Bicarb. Soda.....	6	13
Bleach. Powder.....	2,018	1,440
Manure	3,612	4,486
Soda Crystals.....	940	793
Sulphate of Soda	64	63
Caustic Soda	810	2,546
Other Chemicals	823	
	9,811	10,443

The St. Bede Chemical Co. are now placing a new disinfectant on the market. It is called the "St. Bede Disinfectant." Messrs. Brady and Martin, Newcastle, have the sole agency for the North of England.

New Companies.

FREEDMAN BATTERY COMPANY, LIMITED.—This company was registered on the 1st inst., with a capital of £2,000, in £1. shares, to purchase an invention of C. H. Freedman, of which no particulars are specified. The subscribers are:—

	Shares.
E. F. Wyman, 74, Great Queen-st., W C., printer	1
T. F. B. Evans, Belle Vue, Anerley-park, agent	1
C. H. Freedman, 13, Montague-place, W C, electrical engineer	1
F. Suter, 6, Ospringe-road, electrical engineer	1
H. H. Cooper, 100, St. Donatt's-road, S.E., electrical engineer	1
T. D. Murray, 33, Grosvenor-square	1
M. Davis, Montreal, Canada	1

HENRY BOYS, LIMITED.—This company was registered on the 30th ult., with a capital of £25,000, in £5. shares, to carry on business as brick, coal, and iron masters, and, in particular, with a view to the same, to acquire the business of Henry Boys, of Queen-street, Walsall, James-bridge, and the Padlock Brickyards and Colliery. The first subscribers are:—

	Shares.
J. Gothard, Lawley-street, Birmingham	200
A. Lovekin, Regent-street, Birmingham	200
H. Boys, Queen-street, Walsall	400
W. W. Evans, 93, Blotwinch-road, Walsall	1
T. Walker, 8, Temple-row, Birmingham	100
W. H. Tew, 90, Bordesley-green, Birmingham	20
T. J. B. Elasell, 77, Colmore-row, Birmingham	100

HOME BREWERY COMPANY, LIMITED.—This company was registered on the 29th ult., with a capital of £400,000, in £100. shares, to carry on business as brewers, maltsters, coopers, corn merchants, distillers, licensed victuallers, ice makers, and merchants. The first subscribers are:—

	Shares.
John Robinson, Mappelby-park, Nottingham	1
Mrs. Robinson, Mappelby-park, Nottingham	1
J. S. Robinson, Mappelby-park, Nottingham	1
S. Robinson, Arnold, Nottingham	1
J. T Farr, Daybrook, Nottingham	
S. W. T. Barmsdale, Lucknow-drive, Nottingham	
H. Parr, Bestwood-park, Nottingham	

NICHOLSON BROS., LIMITED —This company was registered on the 27th ult. with a capital of £50,000., in £100. shares, to acquire the business of a brewer, maltster, ale, beer, and porter merchants, etc., now carried on by Nicholson Bros.

The first subscribers are:—

	Shares.
G. T. Nicholson, Conisbrough, Rotherham, Yorks.	1
S. E. Nicholson, Conisbrough, Rotherham, Yorks.	1
M. A. Nicholson, Conisbrough, Rotherham, Yorks.	1
C. E. Nicholson, Kirton-in-Lindsey, Lincs.	1
Beckitt Nicholson, Wath-upon-Dearne, Rotherham Yorks.	1
T. Reeder, Wath-upon-Dearne, Rotherham, Yorks.	1
J. Midgley, Leeds	1

PITT AND MORRISH, LIMITED.—This company was registered on the 27th ult, with a capital of £60,000., in £1. shares, to carry on business as mineral and aerated water manufacturers in all its branches, bottle makers, bottlers, brewers, etc., and to establish agencies of the company in the colonies or elsewhere. The first subscribers are:—

	Shares.
T. Bond, 28A, Wharf-road, City-road, N., mineral water manufacturer	1
G. Morrish, 9, Bomore-road, Notting-hill, mineral water manufacturer	1
J. F. Mainsland, 61, Dunsmure-road, Stamford-hill, N., accountant	1
F. W. Smith, 5, Ickburg-road, Clapton, N.E, restaurateur	1
F. Henland, 1, Southampton-street, Bloomsbury-square, W.C.	1
G. C. Smith, 34, Bishopsgate-street, E.C.	1
A. M. Rea, 69, Talfourd-road, Camberwell, S.E.	1

SEBASTOPOL PHOSPHATE SYNDICATE, LIMITED.—This syndicate was registered on the 1st inst., with a capital of £5,000., in £1. shares, to acquire mining rights in Canada or elsewhere, and to carry on business as phosphate and general miners, timber and lumber merchants. The subscribers are:—

	Shares.
G. J. J. Wells, Chester, analytical chemist	1
C. M. Anderson, 1, Sulphide-villas. Forest-hill, clerk	1
W. F Barnett, 68, Mackenzie-road, Beckenham, clerk	1
E. H. Bernhard, East Finchley, clerk	1
G. C. Lomer, 4, Fenchurch-avenue, merchant	1
F. A. Sibly, 10, Dumany-road, West Kensington, clerk	1
A. E. Rowe, 107, Fenchurch-street, commission agent	1

SILVERLEDGE SYNDICATE, LIMITED.—This syndicate was registered on the 27th ult., with a capital of £15,000., in £1. shares, to acquire from John Henry Sutter the following properties, situate in Red Mountain District, San Juan, Colorado:—The Silverledge Lode Mining Claim, the Morning Star Lode Mining Claim, the Addie S. Lode Mining Claim, the Blue Bird Lode Mining Claim, the Iron Silver Lode Mining Claim, and the Copper Bell Lode Mining Claim. The first subscribers are:—

	Shares.
S. Jennings, Westbury-house, Denmark-hill, S.E.	1
W. P. Owen 18, St. Luke's-road, Clapham, S.W., secretary to a company	1
C. S. Clarke, Fernleigh, Loughton, Essex, accountant	1
H T. Thompson, 143, Albion-road, Stoke Newington, clerk	1
H. Gwynn, 9, Mildmay-park, N., clerk	1
F. S. Holloway, Fairlight-villa, Crawford-street, Camberwell, clerk	1
G. W. H. Brogden, 218, Gresham-house, E C., engineer	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

A. M. TOWERS, A. STEER, and L WILLIAMSON, under the style of Towers and Williamson, Little Bytham, clinker, brick, and tile makers, lime manufacturers, coal merchants, and corn and cake merchants, as far as regards the business of coal merchants and corn and cake merchants.

WARD AND CLIFFE, Werneth, Oldham, mineral water manufacturers.

C. SKELDING, W. T. SKELDING, J. JORDAN, and E. WEBSTER, under the style of the Ketley Brick Company, Kingswinford, bluebrick manufacturers.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Evaporating Liquids. Richard Harburn. 13,322. August 25.
Acid Resisting Cement. W. S. Lea, J. C. Darby, and R. M. G. Dill 13,331. August 25.
Filter. W. C. Penn. 13,335. August 25.
Regulating Heat and Combustion of Fuel. H. Macaulay. 13,355. Aug 25.
Manufacture of Sodium and Potassium. H. Y. Castner. 13,356. Aug. 25.
Electro-Motors. A. Siemens. 13,357. August 25.
Artificial Fuel. W. Fenton and W. Graham. 13,364. August 25.
Ore Concentrators. H. H. Lake. 13,366. August 25.
Pulverizers. J James and C. D Bartle. 13 372. August 25.
Manufacture of Caustic Soda. F Ellershausen. 13,373. August 25.
Pottery Kilns. J. J. Barclay and J. Meikle. 13,374. August 25.
Gas Purification. W. Welch. 13,382. August 26.
Smoke Prevention. J. B. Petrie and J. Petrie. 13,385. August 26
Smoke Prevention. S. Lomax and G. Leek. 13,388. August 26.
Regenerating Furnaces. J. Batten. 13,390. August 26.
Deposition of Alloys. S O. Cowper-Coles. 13,393. August 26.
Treatment of Coal Tar and Pitch. W. H. Nevill. 13,398. August 26.
Air Pumps A. J. Boult. 13,416. August 26.
Jet Apparatus. W. P. Thompson. 13,417. August 26.
Electric Welding. W. P. Thompson. 13,421. August 26.
Forced Draught for Boilers. W. A. Granger. 13,422. August 26.
Cooling and Aërating Wort. H. H. Lake. 13,428. August 26.
Apparatus for Testing Gas or Air Mains. G. Moat. 13,431. August 26.
Pottery Kilns. F. C Roberts. 13,436. August 26.
Production of Azo Colouring Matters. B. Willcox. 13,443. August 26.
Manufacture of Lactose. J. Y. Johnson. 13,444. August 26.
Zincs for Galvanic Batteries. J. Moseley. 13,463. August 27.
Roasting Ores and Metallic Compounds. W. L. Wise. 13,474. August 27.
Production of Coke. M. Fromont. 13,477. August 27.

Production of Pure Aluminium. A. Schneller and A. Astfalck 13,486. August 27.
New Antiseptic. J. Y. Johnson. 13,488. August 27.
Manufacture of Gas and Coke. F. J. Jones. 13,499 August 27.
Aqua Ammonia Engines. C. L. Horack. 13,503. August 28.
Utilising Waste Products from Paper Works. T. J. Hutchinson. 13,504. August 28.
New Sulpho-acid of Naphthylamine. Read, Holliday & Sons, Ld., and T. Holliday. 13,516. August 28.
Electric Meters. G. Hookham. 13,525 August 28.
Smoke Consumption. E. Petersen. 13,556. August 28.
Manufacture of Colouring Matters. H. H. Lake. 13,565. August 28.
Manufacture of Gas. B. H. Thwaite. 13,574. August 29.
Meter for Compressed Gases. G. E. Abrahams. 13,588. August 29.
Gas-fixed Steam Generators. J. Jackson. 13,592. August 29.

Artificial Asphalte. H. P. Williams and E. G. Williams, trading as Pilkington and Co. 13,595. August 29.
Production of Carbonic Acid Gas for Extinguishing Fire. 13,601. August 29.
Treatment of Maize, Wort, and Refuse Spirit Liquors for Obtaining. Dry Yeast Cattle Food and Spirit R. Genge. 13,608. Aug. 29.
Improved Building Composition. J. Brown, J. W. Virgo, and H. F. Ainley. 13,620 August 29.
New Indigo Blue and Sulpho Acids Thereof. J. Y. Johnson. 13 627. August 29.
Odourless Wool Grease. C. A. Feuerlein and J. C. Lahusen. 13,6 34. Aug. 30.
Steam Boilers. D. S. Heys. 13,663. August 30.
Malt Curing Apparatus. M. König. 13,694. August 30.
Apparatus for Drawing Off Fluids and Measuring Volume Thereof. A. Hortmann. 13,698. August 30.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Aug. 30th.

Alkali—
France, 100 c. Arnati & Harrison

Acid *(otherwise undescribed)*
Holland, 12 pks. Middleton & Co.

Acetic Acid—
Holland, 13 pks. A. & M. Zimmermann

Acetate of Lime—
U. S., 412 bgs. Johnson & Hooper

Antimony—
Portugal, 12 t. H. Emanuel

Antimony Ore—
France, 20 t. Hughes, Chemery, & Co.
Singapore, 25 Pillow, Jones, & Co.
Singapore, 50 ,,
A. Turkey, 75 French & Smith
Austria, 60 Major & Field
,, 50 H. R. Merton & Co.

Bones—
U. States, 22 t. H. A. Lane & Co.
Adelaide, 4 Anning & Cobb
E. Indies, 400 G. Bennett & Sons
Sydney, 14 Hicks Nash, & Co.
Cape Town, 30 D. de Pass & Co.
Falkland Isles, 23 t. J. Graves
Spain, 2½ Beresford & Co.

Borax—
Germany, £40. A. & M. Zimmermann
,, 50 F. Stahlschmidt & Co.

Boracic Acid—
Holland, 13 pks. Ross & Deering

Barytes—
Germany, 74 cks. T. & W. Farmiloe
Belgium, 42 Leach & Co.
,, 21 Colthurst & Harding
Holland, 22 O'Hara & Hoar
Germany, 22 W. Harrison & Co.

Chloride of Sulphur—
Holland, £38. R. Morrison & Co.

Caoutchouc—
Singapore, 121 c. Kaltenbach & Schmitz
Zanzibar, 32 L. & I. D. Jt. Co.
E. Indies, 17 Ross & Deering
Portugal, 10 L. & I. D. Jt. Co.
Zanzibar, 77 A. Cheney & Co.
Tamatave, 188 L. & I. D. Jt. Co.
Singapore, 27 Prop. Bull's Wf.
U. S., 100 R. M. S. P. Co.
Zanzibar, 148 L. & I. D. Jt. Co.
,, 11 Anderson, Weber, & Smith
,, 20 Lewis & Peat
,, 98 A. Frey & Co., Ltd.
Tamatave, 50 ,,
,, 39 A. Cheney & Co.
France, 54 Prop. Bull's Wf.
Holland, 12 Sawer, Mead, & Co.
U. S., 199 Prop. Bull's Wf.
,, 144 Steibel Bros.
Tamatave, 336 Hoare, Wilson, & Co.
Zanzibar, 17 L. & I. D. Jt. Co.
France, 28 ,,

Cream of Tartar—
France, 6 pks. W. W. Robinson & Co.
,, 5 W. C. Bacon & Co.
Spain, 27 ,,
France, 10 B. & F. Wf. Co., Ltd.
Holland, 40 Middleton & Co.
France, 5 B. & F. Wf. Co.
Spain, 5 ,,

Copper Ore—
U. S., 40 t. Royal, Mail, S. P. Co.

Chemicals *(otherwise undescribed)*
Germany, £400 A. & M. Zimmermann
,, 67 G. Nicholson
Holland, 7 Phillipps & Graves
Germany, 10 T. H. Lee
,, 60 Beresford & Co.
,, 325 A. & M. Zimmermann
,, 64 T. H. Lee
,, 45 Craven & Co.
,, 7 Barr, Moering, & Co.
Holland, 17 H. Boyce

Dyestuffs—
Extracts
Germany, 280 pks. A. J. Humphrey
France, 180 L. J. Levinstein & Sons
Belgium, 350 ,,
France, 57 Prop. Chamberlain's Wf
Denmark, 4 G. Scrutton & Co.
Argols
France, 38 N. S. S. Co, Ltd.
Cochineal
Canaries, 23 A. Levy & Co.
,, 3 Swanston & Co.
Tanners' Bark
Durban, 25 t. A. & W. Nesbitt
U. S., 11 A. J. Humphrey
France, 10 E. Tuteur
Holland, 50 Fardell & Co.
Adelaide, 1 G. & R. Wills & Co.
Sydney, 123 Baxter & Hoare
Indigo
E. Indies, 5 chts. Arbuthnot, Latham & Co.
Holland, 4 L. & I. D. Jt. Co.
E. Indies, 50 F. W. Heilgers & Co.
,, 9 L. & I. D. Jt. Co.
,, 35 Parsons & Keith
,, 23 A. Harvey
,, 10 F. W. Heilgers & Co.
,, 17 Elkan & Co.
,, 14 J. Owen
Germany, 7 Oldemeyer & Hadenfeldt
E. Indies, 2 L. & I. D. Jt. Co.
Gambier
Singapore, 1,052 pks. ,,
,, 220 Brinkmann & Co.
,, 634 W. H. Cole & Co.
,, 760 L. & I. D. Jt. Co.
,, 505 Cox, Paterson, & Co.
,, 416 Lewis & Peak
,, 627 J. H. & G. Scovell
,, 349 ,,
,, 440 L. & I. D. Jt. Co.
,, 340 ,,
,, 697 ,,
,, 1,661 E. Boustead & Co.
,, 412 W. T. Sargant & Son
,, 183 Beresford & Co.
,, 254 R. & J. Henderson
Fustic
Colon, 32 t. Churchill & Sim
Spain, 48 ,,
Jamaica, 5 J. Hales, Caird, & Co.
Sanders
S. Russia, 20 t. M. Erdmann & Co.
Sumac
Italy, 800 pks. J. Kitchen, Ltd.
,, 50 H. Johnson & Sons
Valonia
Smyrna, 204 t. F. Huth & Co.
,, 54 Hicks, Nash, & Co.
,, 226 A. & W. Nesbitt
,, 50 A. J. Humphrey
,, 45 Anning & Cobb
,, 86 Boutcher, Mortimore, & Co.
Alizarine
Holland, 37 pks. Union L. Co., Ltd.

Dyestuffs—*continued.*
Saffron
Spain. 2 C. Mercadel
Logwood
St. Lucia, 18 t. Lamber & Strong
Jamaica, 50 G. W. Young
Anthracene
Holland, 50 pks Burt, Boulton, & Co.
France, 49 ,,
Cutch
Rangoon, 5,000 L. & I. D. Jt. Co.
,, 1,500 Wallace Bros.
,, 1,500 H. A. Litchfield & Co
,, 2,003 Anderson, Weber, & Smith
Dyestuffs *(otherwise undescribed)*
Germany, 48 cks. Fleming's Oil and Chemical Co., Ltd.
Italy, 8 Stillbeck Bros.

Glycerine—
Germany, £65. D. Yates & Routledge
Holland, 60 Phillips & Graves
,, 68 Knight & Morris
,, 330 Spies, Bros., & Co.
,, 68 Knight & Morris
,, 50 J. Barber & Co.

Gutta Percha—
Singapore, 269 c. Kaltenbach & Schmitz
,, 860 Jewesbury & Co.
,, 85 R. & J. Henderson
,, 550 Kleinwort, Sons, & Co.
,, 208 Huttenbach & Co.

Glucose—
Germany, 800 pks. 800 cwts. J. Barber & Co.
,, 400 400 Baxter & Hoare
,, 14 100 J. Knill & Co.
U. S., 150 860 C. Czarinkow
,, 250 250 H. A. Litchfield & Co.
,, 500 500 Union Lighterage Co., Ld.
Germany, 15 122 S. M. Frankenstein & Co.
,, 31 255 Pillow, Jones & Co.
,, 98 98 Props. Hay's Whf.
,, 25 192 Hyde, Nash & Co.
U. S, 50 281 L. Sutro & Co.
France, 300 300 J. Barber & Co.
,, 340 340 Trier, Meyer & Co.
Germany, 20 20 C. F. Webster & Co.
,, 12 10 H. Lorenz

Hyphophosphate—
Holland, £55 Beresford & Co.

Isinglass—
E. Indies, 2 pks. L. & I. D. Jt. Co.
Penang, 7 ,,
,, 49 ,,

Lead Acetate—
Holland, £200 Petri Bros.

Manure—
Germany, 51 t. Perkins & Homer
France, 330 J. Burnett & Sons
Germany, 108 F. W. Berk & Co.
France, 275 L. Fischel
Phosphate Rock
Montreal, 100 t. A. Hunter & Co.
,, 55 Anglo-Contl. G. Wks.
,, 253 Pickford & Winkfield
Sombrero, 920 ,,
Montreal, 700 A. Hunter & Co.

Nitre—
Germany, 6 cks. Craven & Co.

Naphtha—
Holland, 11 drs. Stein Bros.
,, 23 Burt, Boulton & Co.
France, 113 cks. ,,
Germany, 12 drs. R. Weiss

Pearl Ashes—
France, 100 c. F. W. Berk & Co.
,, 100 Petri Bros.
Montreal, 78 c. Charles & Fox

Potashes—
Montreal, 27 c. Charles & Fox
,, 252 S. Ward & Co.

Potash—
Germany, £41 Vegt & Co.

Potassium Sulphate—
France, 11 cs. Weatherley, Mead & Co.
E. Indies, 93 Lawes Chemical Manure Co.
Germany, 305 pks. T. Farmer & Co.
,, 200 Anglo-Contl. G. Wks.
,, 65 H. Lambert
,, 10 cks. ,,
,, 42 E. Cook & Co.

Potassium Carbonate—
France, 14 pks. J. A. Reid
,, 11 ,,

Phosphoric Acid—
Germany, 35 pks. Phillipps & Graves

Plumbago—
Germany, 330 cs. T. H Lee
,, 79 pks. Prop. Scott's Wf.
Holland, 54 cks. Brown & Elmslie
Germany, 35 Prop Scott's Wf.
E. Indies, 302 brls. Thredder, Son & Co.

Paraffin Wax—
U. S., 2,500 brls. J. H. Usmar & Co.
,, 106 Rose, Wilson & Rose
,, 150 Mordant Bros.
,, 305 pks. H. Hill & Son

Saltpetre—
Germany, 4 cks. G. Nicholson
,, 63 J. Hall & Son
,, 118 P. Hecker & Co.
,, 14 H. Lambert
,, 6 Craven & Co.

Sodium Hyposulphite—
Germany, £45 H. Lambert

Stearine—
Belgium, 63 bgs. H. Hill & Sons

Tartaric Acid—
Holland, 6 pks. B. & F. Wf. Co.
,, 26 ,,
,, 11 ,,
France, 8 ,,
Germany, 20 O. Andrae & Co.

Turpentine—
U. S., 1,962 brls. Nickoll & Knight
,, 50 ,,

Tar—
N. Russia, 68 cks. W. F. Malcolm & Co.
Germany, 200 brls. Linck, Moeller & Co.
,, 100 Watson & Metcalfe

Ultramarine—
Germany, 20 cs. G. Steinhoff
Holland, 2 cks. ,,
Germany, 40 cs. ,,

Zinc Oxide—
Holland, 225 brls. M. Ashby, Ld.
,, 50 cks. Beresford & Co.
,, 25 brls. ,,

LIVERPOOL.

Week ending September 2nd.

Bone Ash—
Antwerp, 189 bgs.
Bones—
Bahia, 1,139 bgs. C. T. Browning & Co.
Ceara, 763 bgs. R. Singlehurst & Co.
Barytes—
Antwerp, 1 ck.
" 28
Caoutchouc—
C. C. Castle, 2 cks. 1 cs. 3 brls.
Axin, 5 bgr.
Gr. Bassa, 1 Cie Fran de l'Afrique
" 3 H. S. Attia Brs.
Sierra Leone, 4 Patterson, Lachoins & Co.
" 6 Pickering & Berthoud
" 24 Cie Fran de l'Afrique
" 11 10 brls.
Bathurst, 13 A. Reis
Goree, 9 C. & L. Johnston
Carthagena, 8 Goyenchie & Co.
Colon, 7 pks. Stiebel Brs.
Addah, 3 cks. F. & A. Swanzy
Accra, 4 1 cs. Hutton & Co.
" 38 J. P. Werner & Co.
" 1 Radcliffe & Durant
" 2 1 bg. H. B. W. Russell
" 6 1 cs. J. H. Rayner & Co.
" 2 brls. 1 bg. C. Lane & Co.
" 2 Hutton & Co.
" 6 F. & A. Swanzy
" 19 J. J. Fischer & Co.
C. C. Castle, 5 cks. 11 A Miller, Brs, & Co.
" 1 W. Duffe & Co.
" 5 1 cs. W. B. McIver & Co.
" 1 J. Bowden & Co.
Bahia, 62 bgs.
Pernambuco, 14 bts. London & Brazil Bank
" 34 brls. Fry Meiero & Co.
" 14
Copper Regulus—
Tucacas, 900 t. Broughton Copper Co., Ltd.
Copper Ore—
Lisbon, 106 t. Harrington & Co.
" 22 brls. Richardson & Co.
Cream of Tartar—
Marseilles, 3 cks.
Dyestuffs—
Fustic
Carthagena, 388 ps. Widow, Durantz & Son
Extracts
New York, 100 bxs.
Myrabolams
Bombay, 361 bgs.
Cutch
Bombay, 629 bxs.
Dyestuffs *(otherwise undescribed)*
Chamla, a quantity. H. Rook, Son, & Co.
Epsom Salts—
Hamburg, 20 brls.
Glycerine—
Rotterdam, 1 drm.
Bordeaux, 101 cks.
Glucose—
New York, 20 brls.
Horn Piths—
B. Ayres, 32 t.
Manure—
Phosphate Rock
Charleston, 575 t.
Manganese—
Bordeaux, 1 ck.
Pitch—
Rotterdam, 48 cks.
Pyrites—
Huelva, 1,440 t. Matheson & Co.
Phosphate—
Antwerp, 174 t. J. T. Fletcher & Co.
Montreal, 150 t. A Hunter & Co.
Sulphur Ore—
Huelva, 1,676 t. Matheson & Co.
Saltpetre—
Hamburg, 12 cks.
Stearine—
Antwerp, 51 bgs.
Tar—
Archangel, 1,257 brls.
Turpentine—
Brunswick, 1,000 cks.
Tartar—
Bordeaux, 7 cks.
Tartaric Acid—
Rotterdam, 9 cks.
Ultramarine—
Rotterdam, 12 cks.
Verdigris—
Bordeaux, 2 cks.
Zinc Ashes—
Montreal, 21 brls. Flinn, Main & Co
Zinc Oxide—
Terneuzen, 60 brls. J. T. Fletcher & Co.
Antwerp, 50

HULL.

Week ending Sept. 4th.

Albumen—
Rouen, 4 cks. Rawson & Robinson
Barytes—
Antwerp, 22 cks. H. F. Pudsey
" 100 bgs. Aire & Calder, N. Co.
Rotterdam, 10 cks. N. E. Railway Co.
Antwerp, 64 Bailey & Leetham
Bremen, 23 Tudor & Sons
Cream of Tartar—
Rotterdam, 2 cks. Hutchinson & Son
Chemicals *(otherwise undescribed)*
Hamburg, 13 cks. Bailey & Leetham
" 3
Dunkirk, 40 pks. Wilson, Sons, & Co.
Stettin, 78 cks. "
Bremen, 1 ck. 1 crby. Veltmann & Co.
" 652 pks. 2 cs. Wilson, Sons, & Co.
" 5 kgs. Storry, Smithson, & Co.
Dunkirk, 72 cks.
Dyestuffs—
Alizarine
Rotterdam, 11 cks. W. & C. L. Ringrose
" 6 "
" 77 1 cs. Hutchinson & Son
" 22 5 pks. W. & C. L. Ringrose
Dyestuffs—*continued.*
Madders
Rotterdam, 1 ck. W. & C. L. Ringrose
" 2 G. Lawson & Sons
Rennet
Rotterdam, 2 cks. W. & C. L. Ringrose
Myrabolams
Bombay, 155 bgs. Wilson, Sons, & Co.
" 4,781
Gutta Percha—
Hamburg, 2 pks. Bailey & Leetham
Graphite—
Hamburg, 34 cks. G. Buckton & Sons
Glucose—
Rotterdam, 40 bgs. Hutchinson & Son
Hamburg, 13 cks. Woodhouse & Co.
Dunkirk, 40 pks.
Stettin, 600 bgs. C. M. Lofthouse & Co.
" 200
Hamburg, 2 cks. G. Lawson & Sons
Napthol—
Rotterdam, 12 cks. W. & C. L. Ringrose
" 1 "
Oxide—
Rotterdam, 2 cs. Hutchinson & Son
Potash—
Rotterdam, 36 cks. W. & C. L. Ringrose
Pitch—
Antwerp, 51 pks. Bailey & Leetham
Rouen, 39 cks.
Dunkirk, 35 brls.
Saltpetre—
Hamburg, 4 cks.
Soda—
Rotterdam, 5 cks. Veltmann & Co.
Stearine—
Rotterdam, 54 bls. G. Lawson & Sons
Salammoniac—
Hamburg, 5 drms. Wilson, Sons, & Co.
Turpentine—
Libau, 52 brls.
Tartaric Acid—
Rotterdam, 2 cks. W. & C. L. Ringrose

TYNE.

Week ending September 3rd.

Alum Earth—
Hamburg, 12 cks. Tyne S. S. Co.
Barytes—
Rotterdam, 41 cs. Tyne S. S. Co.
Glycerine—
Hamburg, 1 drum Tyne S. S. Co.
Glucose—
Hamburg, 50 bgs. Tyne S. S. Co.
Rotterdam, 40 " "
Pitch—
Archangel, 250 brls.
" 150
Soda—
Rotterdam, 18 cks. Tyne S. S. Co.
Tar—
Archangel, 1,095 brls.
" 1,046
Zinc Oxide—
Antwerp, 25 brls. Tyne S. S. Co.

GRIMSBY.

Week ending August 30th.

Zinc Ashes—
Antwerp, 7 cks.

GLASGOW.

Week ending September 4th.

Acetate of Lime—
New York, 168 bgs.
Barytes—
Rotterdam, 44 cks. J. Rankine & Son
Chemicals *(otherwise undescribed)*
Hamburg, 1 cs.
Dyestuffs—
Alizarine
Rotterdam, 167 cks. 1 cs.
Extracts
New York, 100 bxs.
Guano—
Tromsoe, 1,533 sks.
Glucose—
New York, 250 brls.
" 50
Manure—
Antwerp, 50 bgs.
Potash—
Hamburg, 10 cks.
Sodium Chromate—
Rotterdam, 6 cks. J. Rankine & Son
Ultramarine—
Rotterdam, 8 cks. J. Rankine & Son
Zinc Oxide—
Antwerp, 35 cks.

GOOLE.

Week ending August 27th.

Antimony—
Boulogne, 2 cks.
Creosote Salts—
Rotterdam, 37 cks.
Caoutchouc—
Boulogne, 8 cks.
Caustic Potash—
Calais, 61 drms.
Dyestuffs—
Alizarine
Rotterdam, 44 cks.
Madders
Rotterdam, 2 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 22 cks. 65 cs. 7 pks.
Glucose—
Hamburg, 46 cks. 184 bgs.
Dunkirk, 120
Manure—
Phosphate Rock
Ghent, 800 bgs.
Potash—
Dunkirk, 11 cks.
Pyrites—
Huelva, 890 t.
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 6 cks.
Waste Salt—
Hamburg, 600 t. 850 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Aug. 27th.

Ammonium Sulphate—
Treport, 15 t. £170
Dunkirk, 5 56
Arsenic—
St. Petersburg, 5 t. 2 c. £82
Ammonia—
B. Ayres, 5 cs. £85
Ammonium Muriate—
Sydney, 11 c. £14
Ammonium Carbonate—
Bremen, 75 brls. £165
Paris, 26 cks. 160
Acids *(otherwise undescribed)*
St. Petersburg, 100 cs. £250
Cologne, 100 btls. 160
Brimstone—
Philadelphia, 2 t. 17¼ c. £89
Carbolic Solid—
Rotterdam, 7 t. £659
New York, 2 c. 15
Caustic Soda—
Adelaide, 11 t. 11 c. £95
Penang, 1 6 19
Coal Products—
Carbolic Acid
Treport, 80 cs. 6 cks. £156
Paris, 60 100
Naphtha
Treport, 52 cks. 150
Naphthaline
Le Treport, 67 bgs. £38
Rotterdam, 154 28 cks. 126
Hamburg, 12 117
Benzole
Calais, 24 brls. 185
Rotterdam, 10 pns. 142
" 63 dms. 1,112
" 19 cks. 274
Terneuzen, 80 dms. 1,406
Tar
Calcutta, 50 rlts. 22
Karachi, 100 brls. 53
Samarang, 150 120
" 50 40

Coal Products—*continued.*

Pitch

Cette, 604 t. 1,000
Calcutta, 50 rlts. 27
Madras, 20 10
Constantinople, 550 brls. 165
New York, 718 cks. 346
Odessa, 350 105

Copper Sulphate—

Adelaide, 5 t. 110
Melbourne, 20 kegs. £130

Cream of Tartar—

Sydney, 2 t. £220
Melbourne, 1 10 c. 155
Sydney, 1 107
Melbourne, 10 51

Carbonic Acid—

Antwerp, 1 t. 112
Philadelphia, 5¼ c. 39
Brisbane, 3 cs. 21

Citric Acid—

Cape Town, 2 c. £17
Genoa, 2 t. 5 335
Leghorn, 10 74
Amsterdam 2 kegs. 15
Stettin, 1 c. 7
Hamburg, 3 20
Ostend, 1 8
Montreal, 5 37
Adelaide, 2 14

Disinfectants—

Sydney, 4 cs. £11
Hamburg, 50 cks. 300
,, 25 125
Natal, 40 30
Launceston, 17 pks. 42

Hypophosphate of Lime—

Philadelphia, 5½ c. £65

Hydro Carbon—

Brussels, 5 t. £92

Insect Powder—

Auckland, 2 c. £18

Manure—

Stettin, 24 t. 12 c. £123
,, 243 16 854
,, 80 278
,, 158 13 665
Canterbury, 50 235
Hamburg, 20 80
Gothenburg, 194 18 889
Santander, 21 11 187
Port Arenas, 5 44
Hamburg, 48 15 196

Oxalic Acid—

New York, 4 t. 2 c. £140

Potassium Manganate—

Melbourne, 5 t. 3 c. £69

Potassium Chlorate—

Sydney, 5 t. £200

Strontium Nitrate—

New York, 5 t. 2 c. £147

Saltpetre—

Oporto, 2 t. 5 c. £40
Sydney, 2 43
Adelaide, 2 43

Soda Crystals—

Gibraltar, 15 t. 2 c. £49

Sheep Dip—

Natal, 14 c. £19
,, 14 28
Maori, 1 t. 11 300
Taymouth Castle, 100 gls. 23
Auckland, 50 cs. 125
E. London, 50 44

Sodium Hypophosphate—

Rotterdam, 5 cs. £55

Salammoniac—

Constantinople, 2 t. 10 c. £88
Paris, 1 7 47

Sulphuric Acid—

Penang, 2 t. 10 c. £27
Cape Town, 3 36

Sodium Bicarbonate—

Sydney, 12 c. £12
Antwerp, 5 t. 56

Tartaric Acid—

Nelson, 10 c. £75
Sydney, 10 kgs. 63
Adelaide, 8 cks. 124
Aden, ¼ c. 2
Montreal, 15 100
Melbourne, 25 kegs. 166
Adelaide, 8 cks. 194

LIVERPOOL.

Week ending August 30th.

Alkali—

Boston, 70 tcs.
Philadelphia, 33
Rotterdam, 29 cks.
St. Petersburg, 100

Ammonium Carbonate—

Hamburg, 5 c. 2 q. £8
Odessa, 6 t. 1 1 183
Rotterdam, 13 2 11
Venice, 1 1 1 35
Carril, 5 2 8
Corunna, 5 8
Montreal, 1 3 32
Hamburg, 2 2 2 63
Vera Cruz, 3 2 6

Ammonium Muriate—

Antwerp, 7 c. £9
Gefle, 1 t. 8 39
Philadelphia, 6 11 149
Bilbao, 6 10 2 q. 152

Ammonia—

New York, 5 t. £95
Valparaiso, 3 c. 9

Alum—

Lisbon, 11 c. £6
Bombay, 7 t. 37
Smyrna, 4 7 23
Adelaide, 1 2 q. 5
Odessa, 1 8 7
Syra, 2 16 1 14
Smyrna, 3 12 18
Madras, 2 10

Ammonium Sulphate—

New York, 30 t. 6 c. 3 q. £330
,, 25 10 1 297

Albumen—

Vera Cruz, 1 cs. £22

Acetic Acid—

Vera Cruz, 6 brls. £19

Bone Waste—

Rouen, 2 t. 5 c. £13
,, 16 2 96

Bleaching Powder—

Alicante, 20 cks.
Boston, 70
Calcutta, 104 cs.
Genoa, 131 31 brls.
Gibraltar, 123
Hamburg, 110
Havana, 8 cs.
Leghorn, 7
Montreal, 22 tcs. 101 brls.
New York, 257 cks.
Philadelphia, 42
Rotterdam, 15
Rouen, 105
Tarragona, 6
Valparaiso, 30 cs.
Vera Cruz, 8 cs. 7 brls.
Antwerp, 29 cks.
Bordeaux, 89
Boston, 45 170 tcs.
Lisbon, 2 cs.
Trieste, 20 brls.
Vera Cruz, 10

Borax—

London, Ont., 10 c. 1 q. £15
Rotterdam, 1 t. 1 29
Antwerp, 4 3 112
Carril, 4 1 6
Halifax, 6 1 9
Savanila, 1 6
Rotterdam, 1 8 2 39

Caustic Potash—

San Francisco, 1 t. £25

Copper Sulphate—

Sydney, 5 t. £90
Bari, 4 19 c. 3 q. 109
Bordeaux, 9 19 3 180
Calcutta, 5 106
Hamburg, 40 760
Messina, 1 17 2 32
Genoa, 5 5 90
Catania, 2 3 36
Calcutta, 6 5 110
Ancona, 7 3 125
Galatz, 1 18
Vera Cruz, 40 19 718
Christiania, 9 3 158
Hamburg, 10 173
St. Petersburg, 50 4 999
Rouen, 83 17 1,677
Melbourne, 5
Bari, 3 1 58

Copper Sulphate—*continued.*

Ancona, 3 4 2 60
Alexandretta, 6 5
Ancona, 4 12 3 88
Bari, 9 12 3 185
Antwerp, 1 18 3 34
Catania, 1 8 26
Constantinople, 15 17
Bordeaux, 100 3 3 2,000
Ghent, 5 1 100
Montreal, 6 1 1 108
,, 12 7 1 217
Naples, 6 5 2 120
Odessa, 5 19 2 118
Oporto, 1 3 1 23
Rosario, 1 4 2 20
Salonica, 6 4 3 108
Talcahuano, 2 4 2 45
Valparaiso, 6 111
Palermo, 1 2 1 20
,, 5 19 1 112
Catania, 13 6 3 227
Genoa, 6 9 2 130
Hamburg, 1 3 2 20
Vera Cruz, 9 1 3 181
Madras, 5 5

Chromium Trioxide –

Hamburg, 2 c. £8

Caustic Soda—

Acajutla, 8 dms.
Adelaide, 35
Alicante, 20
Antwerp, 74
Ancona, 4
Bahia, 15 60 kgs.
Baltimore, 300
Barcelona, 160 20 cks.
Boston, 700
Catania, 20
Christiania, 15
Dedeagatch, 17
Galatz, 100
Genoa, 203
Guelp, 20
Hamburg, 54
Hong Kong, 30
Ibrail, 20
Leghorn, 57
Marseilles, 20
MexicoCity, 106
Naples, 79
New York, 1,500
Odessa, 200
Oporto, 70
Philadelphia, 642
PortoAlegre, 50
Rio de Janeiro, 15
Rotterdam, 16
Rouen, 25
St. Petersburg, 1,398
San Sebastian, 40
Santander, 30
Seville, 20
Trieste, 15
Tunis, 4
Valencia, 159
Vanegas, 35
Venice, 25
Vera Cruz, 315
Singapore, 11
Algoa Bay, 17 cs.
Ancona, 50
Antofagasta, 50
Bahia, 45
Barcelona, 55 brls.
Bilbao, 9
Carthagena, 70 25
Cui dad Bolivar, 20
E London, 32 cs. 30 bxs.
Fiume, 22 dms.
Ghent, 18
Hamburg, 10
Leghorn, 20 150 cks.
Montreal, 50
Nantes, 89
Naples, 15
Norrkoping, 34
Penang, 75
Pernambuco, 15
Philadelphia, 135 brls.
Port Natal, 10 cs.
Rotterdam, 15 dms.
Rouen, 70
Samarang, 150 kgs.
Santander, 32
Seville, 686 45 brls.
Trieste, 30

Charcoal—

Nantes, 617 bgs. £280

Carbolic Acid—

Rotterdam, 2 c. £7
Yokohama, 1 t. 15 2 q. 184
Hamburg, 5 15 643
Newtairwater, 1 5 90

Carbolic Acid—*continued.*

New York, 2 10 168
Havre, 1 13 68
Rouen, 18 45

Copperas—

Vera Cruz, 27 t. 8 c. £55
Piræus, 2 10 5
Calcutta, 14 8 3 q. 27
Smyrna, 2 12 5
Montreal, 10 11 2 25
San Francisco, 10 20
Montreal, 8 9 21
Syra, 4 2 9

Cream of Tartar—

St. John's, Nfld., 9 c. 2 q. £4

Chemicals *(otherwise undescribed)*

Hamburg, 3 q. £9
Havre, 34 t. 4 c. 307
Vera Cruz, 3 9 2 128
,, 4 cks. 9

Disinfectants—

Yokohama, 40 drs. £45
Rangoon, 1 t. 2 c. 2 q. 10

Epsom Salts—

Rio de Janeiro, 50 kgs.
Havana, 13 brls
Bombay, 54 cks.
Calcutta, 100
Seville, 40

Guano—

Barcelona, 73 t. 16 c. 1 q. £719

Gypsum—

New York, 10 t. 3 q. £20

Lead Nitrate—

Vera Cruz, 4 c. 3 q. £6

Lead Acetate—

Vera Cruz, 11 c. £16

Muriatic Acid—

Callao, 3 c. 1 q. £5

Manure—

Rouen, 30 t. 5 c. £272
Havre, 50 1 245
Las Palmas, 18 130

Magnesia—

Carril, 1 cs.

Magnesium Chloride—

Bombay, 2 t. 2 c. £6

Nitric Acid—

Callao, 4 c. 1 q. £14

Potassium Chlorate—

Cape Town, 1 t. 5 c. £58
Stockholm, 2 89
Sydney, 5 228
Shanghai, 3 15 170
Philadelphia, 3 15 190
Venice, 4 7 170
Odessa, 1 10 75
Bari, 10 22
Oporto, 1 41
Hiogo, 10 443
Genoa, 1 56
Boston, 5 230
Hamburg, 3 135
Hiogo 5 228
Philadelphia, 1 5 57
Valparaiso, 2 15

Potassium Chromate—

New York, 5 c £17

Potassium Carbonate—

Boston, 4 t. 5 c. £72

Pitch—

Bathurst, 2 cs
Havre, 1 ck.

Potash—

Bordeaux, 17 c. 2 q. £20

Potassium Prussiate—

Piræus, 1 c. £5

Salt—

Akassa, 1,200 t.
Anamboe, 14
Gefle, 40
Montreal, 3 4 c.
Opobo, 100
Portland, 343 1
Trangesund, 400
Warburg, 124
St. John's, Nfld., 1¾
Addah, 5
Akassa, 500
Algoa Bay, 5
Ambriz, 45
Antwerp, 102
Boston, 230

Salt *continued.*
Brisbane, 25 t.
Calcutta, 2,655
Cape Coast, 23
Cape Town, 161
Chicago, 400
Conakry, 100
E. London, 45
Ghent, 25
Gr. Bassa, 10
Montreal, 620
Mossel Bay, 25
New Orleans, 100
New York, 1,005
Portland, 481 14 c.
Rotterdam, 200
Salt Pond, 13 11
San Francisco, 205¾
Sherbro, 636 17
Sockholm, 109
Sydney, 100
Trangesund, 1,447
Winnebah, 20
St. John's, 15

Soda Ash—
Alicante, 20 cks.
Baltimore, 221 tcs. 140
Barcelona, 70 brls.
Bilbao, 100
B. Ayres, 320
Colon, 30
Galatz, 42
Ghent, 2
Lisbon, 15
Melbourne, 36 80
New York, 492 102
Oporto, 8
Philadelphia, 666 100
Savanilla, 20
Seville, 7
Sherbrooke, 14
Smyrna, 10
Sydney, 200
Windsor Mills, 93 tcs.
Yokohama, 200
Baltimore, 65 cks.
Boston, 200 bgs 394
Cape Town, 15
Chicago, 36
Melbourne, 230
Montreal, 64 tcs.
New Orleans, 115
New York, 621 684
Oporto, 8 brls.
Porto Alegre, 100
Rio de Janeiro, 210 118
San Francisco, 107
Santos, 5
Smyrna, 6
Sydney, 60

Sodium Bicarborate—
Antwerp, 15 pks.
Brisbane, 30 kgs.
Carthagena, 100 dms. 25 brls.
Colon, 20
Hamburg, 10 cks. 15
Havre, 4 110
Rouen, 50
St. John's, Nfld., 400
Stettin, 40 130
Sydney, 130
Alicante, 50
Barcelona, 100
Constantinople, 80
Copenhagen, 6 92
Hamburg, 60 brls. 20 kgs. 20 bgs. 20 cks.
Melbourne, 400 kgs.
Montreal, 100 cks. 100
New York, 331 brls.
Odessa, 200
Port Natal, 10
St. Petersburg, 200
Valencia, 135

Soda Crystals—
Boston, 280 brls.
Harbor Grace, 20 kgs.
Philadelphia, 593 dms
St. John's, Nfld., 15
Santos, 4 cks.
Boston, 200 brls.
Calcutta, 17
Ibrail, 30
Iquique, 25
Malta, 50
St. John's, 25
Smyrna, 25
Valparaiso, 10

Sodium Silicate—
Barcelona, 16 cks
Havre, 4 brls.
Seville, 85

Sodium Carbonate—
Calcutta, 56 brls.
Corunna, 16

Sulphuric Acid—
Callao, 16 c. £20

Sulphur—
Lagos, 10 c. 1 q. £5
Antwerp, 18 t. 17 80
Madras, 9 18 2 60
Para, 1 2 3 7
Trinidad, 16 11 2 80
Boston, 50 2 225

Saltpetre—
Syra, 2 t. 8 c. 2 q. £53
River Plate, 16 2 17
Para, 10 220
Boston, 100 4 432
Montreal, 3 14 1 26

Sodium Nitrate—
Almeria, 1 t. 5 c. 3 q. £11
Pasages, 6 5 70

Sodium Bichromate—
Genoa, 10 t. 11 c. 3 q £240
Vera Cruz, 5 3 186

Sodium Tartrate—
Vera Cruz, 4 c. £16
Montreal, 2 t. 15 1 q. 70

Salammoniac—
Malta, 6 t. 10 c. 2 q. £158
Syra, 4 1 7
Trieste, 1 1 37
Venice, 5 1 9
Ibrail, 4 3 8
Montreal, 11 1 20
Naples, 11 1 16
Carril, 2 3 5
Alexandria, 1 1 2 36

Strontium Carbonate—
Rotterdam, 11 t. 12 c. £710

Sodium Chlorate—
Genoa, 1 t. £52
Vera Cruz, 1 c. 3 q. 6

Salt Cake—
Baltimore, 150 t. 11 c. £357
" 60 7 143

Sheep Wash—
Algoa Bay, 5 c. £10

Superphosphate—
Bilbao, 100 t. £290

Sodium Biborate—
Hamburg, 16 t. 1 c. 1 q. £480
Montreal, 3 2 2 94
" 3 7 101

Sugar of Lead—
Havana, 6 c. £9

Tartar—
New York, 30 t. £2,850

Tar—
Demerara, 10 brls.
St. John's, Nfld., 95
Banana, 18

TYNE.

Week ending Sept. 3rd.

Ammonium Sulphate—
Hamburg, 77 t.

Alum Cake—
Copenhagen, 5 t 1 c.

Alum—
Carthagena, 5 t. 7 c.

Alkali—
Carthagena, 6 t. 11 c.
St. Petersburg, 81 1
Amsterdam, 6 11
Reval, 54 5
Amsterdam, 41 2
Rotterdam, 3 4
" 1 3
Riga, 6 11
New York, 129 13

Antimony—
Danzig, 10 c.

Barytes Hydrate—
Danzig, 5 t. 6 c.

Bone Ash—
Ergastiria, 1 t. 2 c.

Barytes—
New York, 50 t.

Bleaching Powder—
Hamburg, 51 t.
Christiania, 1 13 c.
" 25 4
Genoa, 40 1
Newfairwater, 38 5
St. Petersburg, 70 2
Danzig, 1 10
Amsterdam, 18 14
" 62 15
Antwerp, 26 16
Carthagena, 3 7
Rotterdam, 9 7
" 8 1
New York, 85 9

Caustic Soda—
Hamburg, 13 t. 13 c.
Christiania, 3
" 4 19
Genoa, 49 17
Copenhagen, 1 16
St. Petersburg, 29
Antwerp, 12 10
Rotterdam, 10 3
Riga, 24 19
New York, 100 2

Copperas—
Stavanger, 3 t. 9 c.

Gypsum—
New York, 91 t. 17 c.

Litharge—
Hamburg, 3 t. 4 c.
Copenhagen, 11
Amsterdam, 5

Manure—
Savona, 100 t.
Esbjerg, 45 1 c.

Plumbago—
Ergastiria, 6 c.

Phosphorus—
Malmo, 6 c.

Potassium Chlorate—
Amsterdam, 2 c.
Antwerp, 2 t. 15
Newfairwater, 5
Riga, 60 7

Soda—
Esbjerg, 14 t. 11 c.
Thisted, 21
Aarhuus, 23 10
Esbjerg, 50
Rotterdam, 17 8
New York, 100

Superphosphate—
Esbjerg, 24 t. 11 c.

Soda Crystals—
Nykjobing, 2 t. 2 c.
Svendborg, 22 10
" 4

Soda Ash—
Hamburg, 7 t. 7 c.
Genoa, 10 12
Newfairwater, 206 6
Gothenburg, 50 3
New York, 45 5

GOOLE.

Week ending August 27th.

Bleaching Preparations—
Rotterdam, 95 cks.

Benzole—
Rotterdam, 17 drms.
Dunkirk, 25 cks.

Coal Products—
Rotterdam, 50 cks.

Chemicals *(otherwise undescribed)*
Ghent, 1 ck.
Rotterdam, 30

Dyestuffs *(otherwise undescribed)*
Boulogne, 3 cks. 2 drms. 2 pks.
Ghent, 2 1 1 cs.

Manure—
Ghent, 168 bgs.

GLASGOW.

Week ending September 4th.

Ammonium Sulphate—
Antigua, 17 t. 13½ c. £176
New York, 51 7 612

Bleaching Powder—
Brisbane, 8 t. 17 c. £63

Chemicals *(otherwise undescribed)*
Quebec, £139

Dyestuffs—
Extracts
Quebec 67 c. £139
Logwood
Quebec, 278½ c. £105
Rotterdam, 3 t. 11 42

Epsom Salts—
Melbourne, 111 c. £24

Pitch—
Bombay, 15 t. £36
Oporto, 40 3½ c. 55

Potassium Bichromate—
Antwerp, 5 t. 9¼ c. £60
Gothenburg, 17¼ 252
Rouen, 21 7 650
Christiania, 7 cks. 80
Rotterdam, 3 39
Japan, 2 13¾ c. 84

Paraffin Wax—
Melbourne, 219 c. £295
Nantes, 10 t. 6¾ 350
Pasages, 15 5¾ 400
Japan 203,521 lbs. 2,147

Soda Ash—
Quebec, 80¾ c. £21

Sodium Bichromate—
Antwerp, £77
Rouen, 12 t. 9 c. 272
Nantes, 5 11¾ 130

Tar—
Bombay, 15 t. 10 c. £33. 10s.

GRIMSBY.

Week ending August 30th.

Coal Products—
Dieppe, 50 cks.

Chemicals *(otherwise undescribed)*
Dieppe, 1 cs.
Malmo, 2 cks.

Dyestuffs *(otherwise undescribed)*
Dieppe, 1 ck.

HULL.

Week ending September 2nd.

Alkali—
Bremen, 10 cks.
Constantinople, 50

Borax—
Copenhagen, 1 cs.

Bleaching Powder—
Drontheim, 30 cks.
Ghent, 17
Stettin, 133

Caustic Soda—
Drontheim, 17 drms.
Libau, 36
Riga, 160
Wyburg, 15 cks.

Charcoal—
Antwerp, 6 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 34 cs. 20 pks.
Amsterdam, 1 29 cks.
Bremen, 8
Christiania, 2
Dunkirk, 30
Danzig, 4 40 pks.
Genoa, 25
Gothenburg, 21 662 slbs. 5
Hamburg, 122 21 cks. 51
Libau, 52
Marseilles, 55 7 30
Melbourne, 1 70 500
Malta, 4
Naples, 4 10
Odessa, 75
Riga, 66
Rouen, 30
Rotterdam, 10 44
Stockholm, 12

Dyestuffs *(otherwise undescribed)*
Antwerp, 10 kg.
Dunkirk, 1
Danzig, 27 cks.
Hamburg, 4 cs.
Rotterdam, 2 2
Stettin, 4
St. Petersburg 26 6

Manure—
Amsterdam, 8 cks.
Copenhagen, 1,603 bgs.
Danzig, 200
Genoa, 100
Hamburg, 400
Stettin, 91 t.

Pitch—
Antwerp, 103 t.
Genoa, 86

Turpentine—
Christiania, 2 cks.
Hamburg, 1 drm.

Tar—
Amsterdam, 5 cks.
Copenhagen 10
Genoa, 226
Gothenberg, 240
Hamburg, 13
Odessa, 100
Rotterdam, 2
Stettin, 4

PRICES CURRENT.

WEDNESDAY, SEPTEMBER 10, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	62/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅜
Picric .. .. ,,	0	1	0½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	0	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	15	0
,, ,, (grey), Hull .. .. ,,	11	12	6
Aniline Oil (pure) .. .. per lb.	0	0	11½
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	1
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	10	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	11	10	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	1½
,, 50/90 ,, ... ,,	0	3	1½
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	7
,, (crude 60°) .. .. per gallon	0	1	10
Creosote (ordinary) .. .. ,,	0	0	3
,, (filtered for Lucigen light) .. .. ,,	0	0	3½
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	5
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	7	6
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	61	0	0
,, Sulphate .. .. ,,	19	10	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	5	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	2	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	3	11
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	6
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	26	0	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	0	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	0	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	5	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9½
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	6⅜
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	4	17	6
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	5	17	6
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	12	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	0	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	0	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	0	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	10	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	2	6
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5½
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	25	15	0
Tin (English Ingots) .. .. ,,	101	10	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	24	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	5	0

THE

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Advertisements intended for insertion in the current week's issue, should reach the office by **Wednesday morning** at the latest.

Communications for the Editor, if intended for insertion in the current week's issue, should reach the office not later than **Tuesday Morning.**

Articles, reports, and correspondence on all matters of interest to the Chemical and allied industries, home and foreign, are solicited. Correspondents should condense their matter as much as possible, write on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication. Sketches should be sent on separate sheets.

We cannot undertake to return rejected manuscripts or drawings, unless accompanied by a stamped directed envelope.

Readers are invited to forward items of intelligence, or cuttings from local newspapers, of interest to the trades concerned.

As it is one of the special features of the *Chemical Trade Journal* to give the earliest information respecting new processes, improvements, inventions, etc., bearing upon the Chemical and allied industries, or which may be of interest to our readers, the Editor invites particulars of such—when in working order—from the originators; and if the subject is deemed of sufficient importance, an expert will visit and report upon the same in the columns of the *Journal*. There is no fee required for visits of this kind.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates:—

30 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

Advertisements of Situations Wanted are inserted at one-half the above rates when prepaid, viz:—

30 Words and under ..... 1s. 0d per insertion.
Each additional 10 words ..... 0s. 3d. per insertion.

Trade Advertisements, Announcements in the Directory Column s, and all Advertisements not prepaid, are charged at the Tariff rates, which will be forwarded on application.

THE CHEMICAL UNION.

THE meeting of the Alkali Trade, called at Liverpool, on Friday in last week, at the instance of the promotors of the Chemical Union, turned out to be an unqualified success. In one financial newspaper, "inspired" no doubt by the opponents to the Union, we were gravely told that only three members of the trade were present. This was totally false—nearly one hundred alkali makers were present, amongst whom were Mr. John Brock (who occupied the chair), Sir Charles Tennant, M.P., J. C. Stevenson, Esq., M.P., Mr. James Tennant, Mr. Geo. Pilkington, Mr. E. K. Muspratt, Mr. Huntley, Mr. J. E. Davidson, representing the Newcastle Chemical Works Co.; Messrs. Hedley and Pryde representing Messrs. Hutchinson's; Messrs. Barlow and Wylde attending on behalf of the Widnes Alkali Co.; Mr. Holbrook Gaskell, senr., Mr. Eustace Carey, and Mr. Holbrook Gaskell, junr., representing the firm of Gaskell, Deacon and Co., Messrs. Davis, Clarkson and Golding of the firm of Golding, Davis and Co.; Mr. Robert Shaw, of the firm of Hall Bros. and Shaw; Mr. Thos. Mattheison, Mr. Thos. Snape, Mr. Mort, and Mr. Liddell, of Mort, Liddell and Co.; Mr. Richmond, of the Liver Alkali Co.; Mr. Cook, of the Atlas Chemical Co.; Mr. Charles Wigg and Mr. G. Lloyd Wigg, of Wigg Bros. and Steel; Mr. Chas Hazlehurst, of Messrs. Hazlehurst and Sons, Mr. J. H. Dennis, of the Globe Alkali Works; Mr. E. Baxter and Mr. W. Baxter; Mr. Rayner, representing Messrs. Kurtz; Mr. Thos. Walker; Mr. McBryde and Mr. Blinkhorn, of James McBryde and Co,; Mr. R. Rigg; Mr. P. J. Worsley, of the Netham Chemical Co.; Mr. Richardson, of Newcastle; Mr. Cannington; Mr. E. Bramwell; Mr. Mawdsley; and Mr. Chadwick, who is both paper-maker and alkali manufacturer. Mr. C. Stead, accountant to the proposed Union, and Mr. Hawkins, solicitor, Liverpool, were also present, amongst others.

The chairman opened the proceedings by welcoming such an influential gathering to Liverpool, and gave a resumé of the labours of the Committee from the time of the inception of the scheme to the present. A proof prospectus was handed to each member of the trade present, from which it was gathered that the capital of the Union is to be eight and a half millions sterling, of which seven millions is set against works, plant, land and buildings, and one and a half millions for stocks and working capital.

The capital of the Union will be allotted as follows:—

Two-and-a-half millions in 5% debentures.

Three millions in 7% preference shares.

Three millions in ordinary shares.

It is understood that the vendors have agreed to take 70% of the purchase money in shares, so that it is quite possible that the public may experience a difficulty in obtaining the allotment of any ordinary shares.

The chairman stated that the Committee had come to the conclusion to issue the prospectus themselves, without the assistance of any financial intermediary. They were confident of success, and he mentioned that five firms, represent-

ing one-and-a-half millions of capital, have stated their intention of taking the *whole* of the purchase money in shares, and it is understood to be the intention of one firm to apply for £100,000 more shares than the amount of their purchase money.

The public will therefore see that the alkali makers at least have confidence in the success of the Union, and the opponents to it must look upon it as *un fait accompli.*

All the alkali works in Widnes, without exception, will fall into the Union. All in St. Helens will join, with one exception. All in Runcorn will go into the Union, without exception. On the Tyne all will be Union works, without exception, and the same in Scotland and Ireland. All the country works, of any importance, save one, will join the Union, and that one would probably join if the proprietors own valuation were accepted, but as moderation has so far been exercised by the Committee in their valuations, they do not see their way to exorbitant values for patents, the future value of which is only problematical.

And now what is to be the future of the Union? If a policy of moderation, so far as regards selling values, be the order of the day, the Union may hold together for many years, but it is rather amusing to see such a *posse* of thorough going free-traders working shoulder to shoulder in such a protectionist scheme. It reminds us *per contra* forcibly of the spiritual advice of the worldly pastor who says, "Do as I say and not as I do." Anyhow, there is no getting over the fact that 150,000 tons of bleaching powder are being made annually, and if all the salt cake produced at the same time be made into caustic soda, about 225,000 tons would be produced. Can this all be sold?

Assuming now that a profit of £2. per ton be realised on the bleaching powder, and £2. also per ton of 70% caustic soda, we have:—

150,000 × £2 = £300,000
225,000 × £2 = 450,000
or a total profit of £750,000

which on the lines of the proposed prospectus would be dvisibile thus:—

2½ millions at 5% = £125,000
3 „ „ 7% = 210,000
3 „ ord. shares = 415,000
£750,000

The £415,000 on the ordinary shares thus amounts to nearly 14% per annum.

Whether such figures could be realised for many years, we do not venture to prophecy, but as an investment the Chemical Union shares look far more healthy than many other schemes that are placed before the British public and receive an unqualified support.

SULPHITE-PULP BOILING.

AN anonymous writer in the *Papier Zeitung*, No. 72, September 7th, 1890, referring to the very interesting experiments of Mr. Thilmany, Kaukauna, U.S.A., on the treatment of different kinds of wood in the bisulphite-pulp manufacture—an abstract of which appeared in *The Chemical Trade Journal*, vol. vi, 1890, pages 303-304—gives the following account of a series of experiments done in the laboratory, on the action of sulphite lyes, of pure aqueous solution of sulphurous acid, and of aqueous solutions of the sulphites of calcium, barium, magnesium sodium and potassium, upon wood and other raw fibrous materials.

With the exception of the "*pinus maritima*" and the sugar and Spanish cane (*saccharum officinarum* and *calamus rodcutum*) the other woods and fibrous plants were all grown on German soil. As shown in the tables, most of the experiments were carried out at a temperature above 100° Centigrade. In each test the wood and lye were placed in a glass tube, hermetically sealed, and then heated to the required temperature in an oven. The glass tubes easily withstood a pressure of from 3 to 4 atmospheres, and were cooled before opening.

The experiments conducted at a temperature below 100° C. were made in small glass-stoppered tubes, and heated in a water bath.

The following tables embody the results obtained:—

"PINUS SYLVESTRIS."

Lye.	Specific Gravity	Time in hours	Temperature Degrees Centigrade.	Boiled Wood, etc.	Remarks.
Calcium sulphite lye	—	12	110–130	half soft	—
„	—	12	about 130	sufficiently boiled	—
„	1·075	6	124·6	„	—
„	—	6	124·6	„	—
„	1·07	6	126·3	„	—
Barium sulphite lye	—	6	124·6	hard, brittle	two tests
„	1·025	6	126·3	not quite boiled	—
„	1·025	16	72	tough	*—
Aqueous sulphurous acid	—	12	110-130	hard, brittle	—
„	—	12	about 130	strongly corroded	—
„	1·025	16	72		
once again	„	15	78·3	tough	*twice boiled
Aqueous sulphurous acid	—	15	78·3	„	*

"PINUS STROBUS."

Calcium sulphite lye	—	12	110–130	soft	—
„	—	12	about 130	over boiled	above test boiled again
„	—	12	about 130	boiled	—
„	1·08	6	120–130	„	—
Ordinary aqueous sulph. acid	—	12	110–130	hard	—
„	—	12	about 130	brown, powder	the last test was boiled twice
„	—	12	„	black, powder	—

"PINUS MARITIMA."

"A" 25 c.c. calcium sulphite lye	about 6° Bé	36	113 6	hard	10·4 grm. wood
"B" 32 c.c. calcium sulphite lye	6° Bé	36	113·6	brown, hard	14·8 grm. wood
"C" 15 c.c. calcium sulphite lye	6° Bé	36	113·6	hard	5·3 grm. wood
Test "A" with fresh lye	6° Bé	12	116	half boiled	2nd time boiled
Test "C" with fresh lye	6° Bé	12	116	still not quite boiled	„
Test "A" again with fresh lye	6° Bé	12	116–117	soft, but not completely boiled	3rd time boiled
Test "C" again with fresh lye	6° Bé	12	116–117	„	„

Lye.	Specific Gravity	Time in hours	Temperature Degrees Centigrade.	Boiled Wood, etc.	Remarks.
"ABIES EXCELSA"					
Calcium sulphite lye	—	12	about 130	boiled	—
,, ,,	1·08	6	120–130	,,	—
,, ,,	1·075	6	124·6	,,	two tests
,, ,,	1·065	6	126·3	,,	with 1% KI.
,, ,,	1·065	6	126·3	,,	,, 1% NaCl.
36 c.c. Calcium sulphite lye	1·055	6	126·3	,,	5·6 grm. wood
100 c.c. Calcium sulphite lye	1·075	6	125	,,	5·0 ,, ,,
120 c.c. Calcium sulphite lye	—	2	118	slightly attacked	5·0 ,, ,,
22 c.c. Calcium sulphite lye ..... (SO_2 of sp. gr. 1·03 saturated with lime.)	—	6	126·4	not completely boiled	1·1 ,, ,,
25 c.c Calcium sulphite lye ..... (SO_2 of sp. gr. 1·03 with less lime.)	1·035	6	126·4	well boiled	1·25 ,, ,,
22 c.c. Calcium sulphite lye ..... (SO_2 of sp. gr. 1·03 + a little $CaSO_3$.)	1·035	8	150	black-brown completely destroyed	1·25 ,, ,, $CaSO_3$ separated out
20 c.c Calcium sulphite lye ..... (SO_2 of sp. gr. 1·03 saturated with lime.)	—	8	150	bright brown, quite soft, overboiled, covered with hard crust of $CaSO_3$	0·9 grm. wood
14 c.c. Calcium sulphite lye	1·05	36	116·6	white, well boiled	0·25 ,, ,,
13 c.c. Calcium sulphite lye	1·05	36	116·6	white, well boiled	0·70 ,, ,,
25 c.c. Calcium sulphite lye	1·05	36	116·6	well boiled	2·2 ,, ,,
21·5 c.c. Calciumsulphite lye ..... (1% NaCl added.)	1·05	36	116·6	,,	5 ,, ,,
$CaSO_3$ dissolved in HCl	—	6	126·3	,,	—
Magnesium sulphite lye	—	12	110–130	brown, soft	—
Magnesium sulphite lye	—	12	about 130	boiled	—
30 c.c. Magnesium sulphite lye	1·015	6	126·6	nearly boiled	4·5 grm. wood
Barium sulphite ..	—	6	124·6	tough, destroyed	two tests
Potassium sulphite	—	12	about 130	boiled	,,
Sodium sulphite ..	—	12	,, 130	,,	,,
Ordinary aqueous SO_2	—	12	,, 130	,,	—
"LARYX DECIDUA."					
Calcium sulphite ..	—	12	110–130	tough	—
Ordinary aqueous SO_2	—	12	110–130	hard and brittle	—
FAGUS SYLVATICA.					
Calcium sulphite lye	—	12	110–130	quite soft	—
Barium ,, ,,	1.025	16	72	brittle	—
Aqueous SO_2	—	12	110–130	strongly corroded	—

Lye.	Specific Gravity	Time in hours	Temperature Degrees Centigrade.	Boiled Wood, etc.	Remarks.
BETULA ALBA.					
Calcium sulphite lye	—	16	72	scarcely attacked	twice boiled
,, ,, again	—	15	78·3	tough	twice boiled
POPULUS.					
Calcium sulphite lye	—	12	about 130	sufficiently boiled	—
,, ,,	1·08	6	120–130	,,	—
,, ,,	1·075	6	124·6	,,	—
,, ,,	—	6	124·6	,,	—
,, ,,	1·07	6	126·3	,,	—
Barium ,,	—	6	124·6	hardly boiled	two tests
,, ,,	1·025	6	126·3	,,	—
Aqueous SO_2	—	12	about 130	brown—boiled	—
ABIES CANADENSIS.					
9 c.c. calcium sulphite lye	1·065	6	126·6	sufficiently boiled	1·9 grm. wood
8 c.c. calcium sulphite lye	1·05	6	126·6	,,	3 ,,
5 c.c. calcium sulphite lye	1·04	6	126·6	not quite boiled	0·15 ,,
35 c.c. calcium sulphite lye	1·055	6	126·6	,,	5 ,,
7 c.c. magnesium sulphite lye	1·015	6	126·6	still, not boiled	0·27 ,,
12·5 c.c. barium sulphite lye	1·015	6	126·6	brown, destroyed	1·2 ,,
4 c.c. potassium sulphite lye	1·04	6	126·6	somewhat soft	1·0 ,,
5·5 c.c. sodium sulphite lye	1·02	6	126·6	do., over boiled	1·33 ,,
4 c.c. aqueous SO_2 (ordinary)	1·02	6	126·6	brown, brittle	0·07 ,,
9 c.c. aqueous SO_2 (ordinary)	1·02	6	126·6	,,	0·67 ,,
QUERCUS ROBUR.					
Calcium sulphite lye	1·08	6	120–130	hardly boiled	—
Calcium SO_3, dissolved in H. Cl.	—	6	126·3	still, not quite boiled	—
Sodium sulphite lye	—	12	about 130	half soft	—
,, ,,	—	12	,, 130	not quite boiled	—
LINUM USITATISSIMUM (FLAX).					
Calcium sulphite lye	1·08	6	120–130	sufficiently boiled	—
,, ,,	—	16	72	somewhat soft	boiled again
,, ,, second time	—	15	78·3	still tough	boiled twice

Lye.	Specific Gravity	Time in hours	Temperature Degrees Centigrade.	Boiled Wood, etc.	Remarks.
ORDINARY STRAW.					
Calcium sulphite lye	1·08	6	120–130	soft	—
Barium ,,	1·025	16	72	somewhat soft	—
Aqueous SO_2	1·025	15	78·3	not quite boiled	boiled a second time
,, ,,	—	15	78·3	soft, quite boiled	—
SACCHARUM OFFICINARUM (SUGAR CANE).					
Calcium sulphite lye	—	12½	120–130	overboiled	—
,, ,,	—	12	about 130	sufficiently boiled	—
,, ,,	—	15	78·3	tough	—
Barium ,,	—	15	78·3	tolerably soft	—
Aqueous SO_2	—	12	about 130	sufficiently boiled	—
CALANIUS RUDENTUM (SPANISH CANE).					
Calcium sulphite lye	1·08	6	120-130	sufficiently boiled	—

Both of the tests of *abies excelsa* were intentionally heated to 150°C., and as cellulose manufacturers express themselves, were "*overboiled*," that is to say, the action of the lye was too great, due to too long boiling, or to too high a temperature. Sulphite of lime separated out as a precipitate in both cases.

The barium sulphite lyes used in the experiments, were formed by dissolving barium oxide in aqueous sulphurous acid, and were very weak, as sulphurous acid dissolves but little of the base.

From the experiments the author arrives at the following conclusions, viz:—

In the boilings conducted below 100°C., all the wood experiments remained hard and tough. The other fibrous plants e.g. flax, straw, etc., were only half soft.

In those experiments conducted above 100°C., the woods treated with pure aqueous sulphurous acid were brown, and all tests, besides *abies excelsa*, *populus*, and sugar cane, *saccharum officinarum* remained hard or were brittle. On the contrary, the woods treated with metallic sulphite lyes were mostly white. With calcium sulphite lye nearly all the woods were soft, white, and sufficiently boiled. Excepting *abies excelsa*, the whitest was the *populus*, whilst *laryx decidua* (Larch, a strongly resinous wood), remained tough. *Pinus Maritima* always remained hard and yielded a strongly aromatic odour and a sticky or viscuous lye. *Quercus robus*, (oak), as is well known, is with difficulty boiled by the bisulphite methods. With magnesium potassium and sodium sulphite lyes, the wood remained almost always soft, or tolerably soft, whilst with weak barium sulphite lye the woods were tough and hard. With this reagent the *populus* was easily boiled, yielding soft white fibre.

Deodorisation of Naphthalin.—Naphthalin has such a disagreeable odour that its use in medicine and surgery is considerably retarded thereby, and it has been found that the mixture of camphor and other deodorants with it is only of temporary benefit. But if the naphthalin be mixed with some benzoin, and then sublimed, the sublimate of naphthalin is free from tarry odour and is pleasant to smell; moreover, it retains this pleasant odour, although this is not the case when the naphthalin is simply mixed with tincture of benzoin or benzoïc acid.

A New Red.—Palatine red is a new dyestuff sent out in the form of a brown powder, easily soluble in water to a red solution, which is not altered by dilute sulphuric acid, but is turned red brown by caustic soda; stannous chloride forms a crimson precipitate which is dissolved and decolourised on boiling; and it dissolves in strong sulphuric acid to a blue solution. Palatine red dyes wool in an acid bath, which is completely exhausted. The shades obtained incline to crimson, that do not bleed into the white, although they lose colour on soaping. The dyed fibre is turned blue by strong sulphuric acid, is not altered by hydrochloric acid, and is turned brown by caustic soda.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Buckley.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

Chadderton Iron Works Co., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, Plaistow, Essex.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

Galloways, Limited, Manchester.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co. Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters

Joseph Kershaw and Co., Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Meldrum Bros., Manchester.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.—Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

ALPHA AND BETA-NAPHTHOL.

THESE two bodies are of great importance in the production of colours direct on the fibre, either for Read Holliday's vacanceine reds, or in the ingrain reds produced from Brooke, Simpson, and Spiller's primuline and similar colouring matters. As the shades yielded by these two isomeric bodies are so different, (beta-naphthol giving bright reds, while alpha-naphthol gives brownish reds,) it becomes a matter of some importance to be able to discriminate between the two.

The following description of a few characteristic reactions will therefore be found useful; 10 c.c. of an aqueous solution of beta-naphthol containing 0·2 gram per litre, when mixed with 2 c.c. of 90 per cent. alcohol, 2 c.c. of nitric acid and 10 drops of mercuric nitrate solution, gives an intense orange-red colour, unaltered on boiling, which imparts a rose-red tint to gun-cotton. Sulphurous acid does not destroy the colour, or but slowly; the mixture passes to rose colour, becomes turbid, and at length gives a yellow or black deposit of mercuric oxide. Chloroform takes up the original colouring matter, and becomes intense ruby-red, turning greenish-yellow after some time. Under the same conditions ether becomes yellow. If, instead of the mercuric nitrate and nitric acid, three drops of a saturated solution of potassium nitrate, and ten drops of sulphuric acid be added, an intense violet-red colouration results, which is destroyed by sulphurous acid, the colour turning to a greenish yellow. Chloroform becomes greenish-yellow, and ether yellow. Gun-cotton takes up the colour, assuming a wine-red tint.

Alpha-naphthol gives with the mercuric nitrate mixture an orange-yellow colour, not changed on heating. Chloroform takes on an orange-yellow colour, while ether is coloured a greenish-yellow. Sulphurous acid very soon produces a brick-red precipitate, which rapidly settles, leaving a slightly yellow liquid; gun-cotton is tinted yellow. With the potassium nitrate mixture alpha-naphthol gives a reddish-brown colour, changing to a red on boiling. Chloroform takes up from this a greenish-brown colour, and ether becomes slightly greenish-yellow, while the acqueous solution takes a rose tint. The colouration is rapidly destroyod by sulphurous acid, passing to a dirty green, while gun-cotton is dyed a dirty yellow.—*Textile Mercury.*

THE ACTION OF LIGHT UPON THE DIAZO COMPOUNDS OF PRIMULINE AND DEHYDROTHIOTOLUIDINE.

A METHOD OF PHOTOGRAPHIC DYEING AND PRINTING.

BY ARTHUR G. GREEN, CHARLES F. CROSS, AND EDWARD J. BEVAN.

A Paper read before the British Association at Leeds.

IN the early part of 1887, one of us (Green) discovered that by heating paratoluidine (2 mols.) with sulphur (4 to 5 atoms) at 200°–300° C. a very complex amido base was obtained, which on treatment with fuming sulphuric at a low temperature was converted into a sulphonic acid, the alkaline salts of which were easily soluble in water, and had the peculiar property of dyeing cotton primrose yellow from an alkaline or neutral bath without the use of a mordant. Further, the amido compound thus fixed upon the fibre could be diazotised *in situ* by passing the material through a weak solution of nitrous acid, and when diazotised could be combined with various phenols and amines, thus producing a variety of different colours, which being formed within the fibre, were all distinguished by great fastness to washing, &c. The soluble amido sulphonic acid was named "Primuline" by its discoverer, and has found a very extensive employment in cotton dyeing; the colours produced from it within the fibre were called "Ingrain Colours."[1]

Although the chemical constitution of primuline base (of which primuline is the mono-sulphonic acid) has not yet been determined with certainty, there is no doubt that it is a condensed derivative of dehydrothiotoluidine, a body which always accompanies it in its formation, and that it differs from the latter in exactly the same way as dehydrothiotoluidine itself differs from para-toluidine. As there is scarcely any doubt that dehydrothiotoluidine has the formula—

$$C_6H_3(CH_3)<\overset{S}{\underset{N}{>}}C.C_6H_4(NH_2)$$

i.e., is an amido-benzenyl-amido-thiocresol, it follows that the formula of primuline or rather of its chief constituent, is [2] probably

$$C_6H_3(CH_3)<\overset{S}{\underset{N}{>}}C.C_6H_3<\overset{S}{\underset{N}{>}}C.C_6H_3<\overset{S}{\underset{N}{>}}C.C_6H_3(SO_3Na)(NH_2)$$

1. A. G. Green, *Journ. Soc. Chem. Ind.*, 1888, p. 179.
2. A. G. Green, *Journ. Chem. Soc.*, 1889, p. 227; *Ber.* 22, 968; P. Jacobson, *Ber.* 22, 330; L. Gattermann, *Ber.* 22, 422; W. Pfitzinger and L. Gattermann, *Ber.* 22, 1,063.

In a similar manner, by heating meta-xylidine or pseudo-cumidine with sulphur, homologues of primuline are obtained, which, like primuline itself, dye cotton without a mordant, and can be diazotised and combined with phenols within the fibre.

It has been long observed by one of us (Green) that the diazo compound of primuline was very sensitive to the action of light, being readily decomposed thereby, and losing its property of combining with phenols and amines. Upon this fact we have now founded a photographic process, by means of which, designs can be produced in fast colours upon cotton, silk, wool, linen, or other fabrics. It can also be applied to wool, xylonite, celluloid, paper, or to gelatine films upon glass, thus affording a very wide range of employment. The process, which is a very simple one, merely depends upon the fact, that if a material containing diazotised primuline be exposed to light under a design, those parts which are acted upon by light will be decomposed, whilst the parts protected from the light will remain unaltered, and consequently, on subsequent development with a phenol or amine, will produce colours, whilst the decomposed portions will not. The details will of course depend somewhat upon the material to be treated. As an instance we may take the production of a design upon cotton cloth, cotton velveteen, &c. The material is first dyed with primuline from a hot bath containing common salt until the required depth is obtained. It is then washed and diazotised by being immersed for ¼ minute in a cold bath containing about ¼ p.c. of sodium nitrite, and strongly acidified with sulphuric or hydrochloric acid. The material is washed again and exposed damp (or if preferred after having been dried in the dark) to the action of light beneath leaves, ferns, flowers, or other natural objects, or beneath glass or transparent paper upon which may be painted or printed any design which it is required to copy. Either the arc electric light or daylight may be employed; in the latter case the time of exposure will of course vary with the intensity of the light; under ½ minute is required in bright sunshine and nearly ½ hour in very dark cloudy weather. When the decomposition is complete, which may be readily ascertained by means of a test slip exposed simultaneously, the material is removed from the light and either passed into the developing bath at once, or is kept in the dark until it is convenient to develop it. The developing bath consists of a weak solution (¼ to ½ p.c.) of a phenol or amine made suitably alkaline or acid, the phenol or amine employed depending upon the colour in which it is required to produce the design, thus:—

For *red* . . an alkaline solution of *beta*-naphthol.
" *maroon* . an alkaline solution of *beta*-naphthol-di-sulphonic acid.
" *yellow* . an alkaline solution of phenol.
" *orange* . an alkaline solution of resorcin.
" *brown* . a solution of phenylene diamine hydrochloride.
" *purple* . a solution of *alpha*-naphthylamine hydrochloride.

If it is required to produce the design in two or more colours, the respective developers, suitably thickened with starch, may be applied locally by means of a brush or pad. After development the material is thoroughly washed and requires no further fixing.

Linen, silk, and wool are treated in exactly the same way. Paper for copying drawings, &c., is coated on the surface with primuline by means of a brush or roller. For the production of gelatine films upon glass the primuline is incorporated with the gelatine before being applied to the glass.

In place of ordinary primuline the homologues already mentioned may be used, for silk and wool the primuline may be replaced by dehydrothiotoluidine-sulphonic acid, by means of which, colourless backgrounds may be obtained.

Concerning the reaction which occurs when the diazo-primuline or the diazo-dehydrothiotoluidine is decomposed by light, we cannot, at present, say anything definite, except that the diazo group is completely destroyed, for on treatment with sodium hydrosulphite (true hyposulphite), it cannot be converted into the amido-group (re-forming primuline or dehydrothiotoluidine). The reaction may consist in a replacement of the N_2 group by OH or by H, or may be even more complex. Although we cannot affirm that this reaction to light is a property of the diazo-compounds of this group of bodies only, yet it is certain that they possess an extreme susceptibility to light far greater than that of other diazo-compounds, whilst at the same time they are far more stable to heat. It is thus possible that this property may depend in some way upon the sulphur which they contain.

RECENT DEVELOPMENT IN THE CHEMICAL PLANT TRADE.—It is encouraging to notice that Mr. Joseph Cortin, the enterprising manufacturer of specialities in chemical plant has recently greatly enlarged his works, owing to the active demand for this class of goods. Those of our readers who remember the old premises will readily understand that in busy times, orders must necessarily have been refused from sheer want of the means to execute them. This has now been altered, and the new and commodious premises, and modern machine tools and appliances which Mr. Cortin has erected will enable him to meet the increasing business in the various departments—regulus castings—non-rotative acid valves, brass taps and valves, and other well known specialities.

THE RIVER AIRE.

At the Leeds meeting of the British Association, Messrs. T. H. Easterfield and J. Mitchell Wilson, M.D., read a paper on "The River Aire," from which we quote the following conclusions:—"Our facts show that both Bradford and Leeds districts are responsible for excessive pollution. Our results may be summed up as follows: (1) That the river, originally a limpid stream, receives pollution from all the townships on its banks until it passes Leeds, when the pollution has become so great that the effect of smaller towns below it becomes inappreciable; (2) that between each centre of population the river appears to cleanse itself to a small extent by natural causes; (3) that nearly all the impurities rise and fall simultaneously, but not in the same proportion; (4) that there is no evidence that the 'warp' is chiefly brought down by the rivers, but rather that it is brought up the river by the tide. If we consider all the results of our inquiry from a practical aspect, it will be admitted that the provisions of the Pollution of Rivers Act have not been, and are not being, much enforced in the water-shed of the Aire. Each gallon of the filtered water taken throughout the whole length of the river has been shown to contain mineral and organic impurities in ever-increasing amounts. Even the comparatively minute masses of the impurities which we have shown to be present in each gallon of water analysed must, if measured by the daily flow of many thousand gallons of river water, represent enormous quantities of waste material, which might perhaps be more profitably utilised, or serve some other end than that of converting the natural blessing of a pure stream into the doubtful advantage of a navigable sewer."

RESULTS OF ANALYSIS.

	Suspended Solids.	Dissolved Solids.	Chlorine.	Free Ammonia.	Organic Ammonia.	Oxygen required.	Sulphuric Acid.
Malham Cove, Aug. 18	0·0	15·5	·45	0·0	·0066	3·6	0·4
Gargrave, Aug. 5	1·0	17·5	·7	·0196	·0154	1·6	1·8
Skipton ,,	1·5	17·5	·875	·035	·0182	2·4	3·1
Above Keighley ,,	1·0	17	·9	·021	·014	2·1	2·4
Below ,, ,,	2·0	17	1·1	·0227	·0192	2·2	2·7
Saltaire ,,	1·5	17·5	1·0	·028	·0175	1·8	3·1
Shipley ,,	7·5	27	1·8	·0997	·0455	6·8	5·25
Shipley, Aug. 20	2·0	21	1·2	·0297	·04375	4·45	5·25
Kirkstall ,,	2·1	25	1·7	·1295	·0595	5·5	5·88
Knostrop ,,	6·5	30·5	2·9	·3535	·084	5·9	8·73
Allerton ,,	4·0	31·5	3·4	·2905	·0612	4·9	9·99
Aire & Calder ,,	7·5	25·5	3·7	·231	·0472	4·1	6·59
River Ouse ,,	64	17	1·2	·0875	·0245	3·0	4·4
River Ouse, Oct. 7th, 1889	263	20	3·5	·1302	·0336	1·52	4·7

NEW METHOD FOR THE SEPARATION OF ZINC FROM IRON AND MANGANESE.

BY T. RIBAN.

This method is based on the different behaviour of zinc and iron towards sulphuretted hydrogen in the presence of thiosulphates of the alkalies, and has the advantage of being much more rapid than any of the methods now in use. The solution is diluted until not more than 0·1 gram. zinc is contained in every 100 c.c. Ammonium carbonate is added until a precipitate is formed, which is then dissolved by the addition of a few drops of hydrochloric acid; sulphuretted hydrogen is then passed in until the larger portion of the zinc is precipitated; a large excess of ammonium thiosulphate is then added and sulphuretted hydrogen again passed through until all the zinc is precipitated and the iron remains in solution. The precipitate is allowed to settle for 5-6 hours, washed thoroughly with warm water containing sulphuretted hydrogen, dried, mixed with a little sulphur and heated in a Rose's crucible in a current of hydrogen. To estimate the iron in the filtrate, the latter is concentrated, oxidised with nitric acid, and precipitated as usual with ammonia. The method is, of course, equally applicable in the presence of manganese, and also in the presence of calcium, the thiosulphate of which is soluble.

If the estimation is required to be very exact it is advantageous to dissolve the ignited zinc sulphide, which may contain traces of iron in hydrochloric acid, and after oxidising to add ammonium chloride, and precipitate with ammonia. As a rule the small quantity of iron present is only precipitated on boiling.—*Chem. Technisch. Cent. Anzeiger.*

RECIPES FOR DYERS.

The following are mostly translations from foreign sources. We do not guarantee the results from these recipes, but give them for the purpose of shewing our readers what their foreign competitors are doing:—

DARK BROWN ON COTTON.

For 100 lb. cotton. Mordant at the boil with
10 lb. catechu,
2 lb. logwood extract,
¼ lb. magenta,
for three hours, then darken in a new bath with
3 lb. bichromate of potash,
2 lb. soda.

DARK FAWN ON WOOL.

For 100 lb. wool. Work in a bath with
3½ lb. tartar,
5½ lb. sumac,
13 lb. fustic,
10 lb. Brazil wood,
for 1½ hours at the boil. Sadden with
1 lb. copperas.
Boil one hour longer, then add
5 lb. Brazil wood,
1 lb. Sanders' wood,
and boil ¾ hour longer.

DARK BROWN ON WOOL.

For 100 lb. Mordant by boiling for 1½ hours with
3 lb. bichromate of potash,
1½ lb. tartar.
Dye with
50 lb. fustic,
5 lb. logwood,
17 lb. Sanders' wood,
for 1½ hours at the boil. Sadden by adding
5 lb. copperas,
2½ bluestone.
Work for five minutes at the boil, allow to stand for ten minutes, lift and dry.

DARK OLIVE BROWN ON WOOL.

For 100 lb. wool. Dye in a bath at the boil for 1½ hours with
55 lb. fustic,
10 oz. logwood,
1¼ lb. sumac,
6 oz. cloth red B,
½ lb. fast brown G,
1 oz. fast yellow.
Darken in a bath of
4 lb. bluestone,
2½ lb. copperas,
for ten minutes, wash and dry.

CHEAP BLACK ON MIXED COTTON AND WOOL CLOTH.

Boil in a bath of
25 per cent. logwood extract,
4 ,, fustic extract,
13 ,, soda,
8 ,, bluestone.
Work at 120° F. for some minutes, then raise to boiling, until a good black is got, after which enter in a new bath containing
4 per cent. bicromate of potash.

BLACK ON WOOL FROM ALIZARINE COLOURS.

A: Red Shade Black.

For 100 lb. wool. Mordant by boiling for 2 to 2½ hours in a bath containing
3 lb. bichromate of potash,
2½ lb. tartar.
Dye in a bath containing
Alizarine blue WX 32¼ lb.,
Cœruleine W 1¼ lb.,
Alizarine orange W. 3 lb. ¼ oz.

B: Reddish Shade.

Mordant as before. Dye with
Alizarine blue WX 32¼ lb..
Cœruleine W 1½ lb.,
Alizarine orange 2½ lb.

C: Blue Black.

Mordant as before. Dye in a bath containing
Alizarine blue WX 36½ lb.,
Cœruleine W 1½ lb.,
Alizarine orange W 1½ lb.

Enter the wool in the cold, work for half-hour, then gradually raise to boil and dye boiling for 1½ hours. Then lift, wash and dry.—*Textile Mercury*

MANURES FOR VINES.

THE *Progres Agricole et Viticole* gives a report of the experiments of M. Cayon, on this subject, in the following terms:—

Various potash manures have been employed—chloride of potassium, sulphate of potassium, carbonate of potassium, and very dilute solutions of sulphide and sulpho-carbonate of potassium. These last two products are habitually employed as insecticides, but in these experiments their effect as fertilizers was ascertained.

All these substances were spread at the foot of separate stocks. Three grammes of actual potash being used in 1884, and four grammes in 1885.

The following table contains a statement of the results obtained:—

	Relation of crop to usual crop.
Usual crop	1·00
Carbonate of potassium	1·74
Sulphate of potassium	1·29
Chloride of potassium	1·20
Sulphide of potassium	0·83
Sulpho-carbonate of potassium	0·76

The actual yield usually obtained, taken as unity in the preceding table, was 3·701 gm. of shoots for the two years.

At Pierroton, therefore, carbonate of potassium has shown itself to be the best fertilizer. This fact should be compared with the result recently obtained by M. Georges Ville, who worked, if I mistake not, on similar land.

The sulphide and sulpho-carbonate of potassium, far from being beneficial to growth, have actually proved antagonistic to it, (experiments made at the Mas de Las Sorres, Montpelier, by M. Andoynaud, showed, on the other hand, a well marked fertilizing effect due to sulphide of potassium).

To test the effect of fertilizers containing lime or magnesia as a basis, carbonate of calcium, sulphate of calcium, chloride of calcium in solution, carbonate of magnesium, and sulphate of magnesium, have been tried. Such quantities were taken as corresponded to 5 grammes of lime for each experiment, and to 1 gm. of magnesia in 1884, and 2 gms. in the following year. The yield of shoots was then ascertained, and the following table calculated:—

	Relation of crop to usual yield.
Usual crop	1·00
Chloride of calcium	1·16
Sulphate of calcium	1·09
Carbonate of calcium	0·83
Carbonate of magnesium	1·78
Sulphate of magnesium	1·57

The actual weight of the crop taken as unit was 2·978 grammes.

It will be observed that the fertilizers rich in lime, in spite of the poverty of the soil in that constituent, have produced but little effect. The first two have increased the yield by a small and insignificant amount, while carbonate of calcium has actually diminished it. It was well known that the vine, formerly so vigorous in chalky soils, was not less so in land free from lime, provided that it were properly cultivated, but it could hardly have been supposed that the addition of lime would prove injurious. This result must, of course, be received with caution, and the experiments should be carefully repeated and multiplied. The point in question is well worth the trouble of investigation, if only to throw light on the real effect obtained by cultivators who habitually lime their land.

The magnesium fertilizers show a distinctly favourable action, carbonate of magnesium in particular increasing the crop by three quarters.

THE BREWING INDUSTRY IN BAVARIA.

A Report from the British Legation in Munich, lately issued by the Foreign Office, contains much interesting information respecting brewing and beer in Bavaria. Brewing has always been one of the most important Bavarian industries, but of late years it has attained vast proportions. The total production of beer in Bavaria in 1868 was was over 7½ million hectolitres, while in 1888-9 it was 13½ millions, or more than 28 per cent. of the production of all Germany. The amount produced per head of population in Bavaria was 2.47 hectolitres, and in Germany 0·91 hectolitre. The Bavarian export has increased from a quarter of a million hectolitres in 1875, to over two millions in 1889, of which over 1½ million went to North Germany, and 189,000 hectolitres to foreign countries. In 1888 there were 6,931 breweries, of which 4,718 were privately owned, 52 belonging to companies, and the rest to the local communities. The amount of malt used was just 6,000,000 hectolitres. In 1889 the quantity of beer brewed had risen to 14¼ million hectolitres. The figures show that brewing is still in Bavaria a decentralized industry, as more than half the brewers consumed less than 100 hectolitres of malt, and more than five-sixths less than 500. But the number of small breweries is diminishing. 1889 was the most favourable year on record for Bavarian brewers. A good harvest of barley, and a superabundant one of hops, combined, with a good demand both at home and abroad, to make the year an exceptional one. The steady demand for Bavarian beer, chiefly in North Germany, continued, and there are no present apprehensions of a falling-off. The swamping of the small breweries by the large ones is not peculiar to Bavaria, and has been going on throughout Germany. In five years alone, 2,100 small breweries ceased to exist from similar causes throughout Germany, and this was principally the case in Prussia and North Germany. Munich stands at the head of Bavarian beer production, export, and consumption. At the beginning of the century it possessed 72 small breweries, while in 1876 there were only 28 large breweries for brown beer, but these produced more than one-tenth of the whole of the Bavarian brown beer, the greater portion being consumed in Munich itself. The Munich consumption in 1876 amounted to 5·56 hectolitres per head per year, the highest in the world. But as foreigners in Munich are not reckoned the true figure was somewhat lower. In Vienna the consumption was 2 96 hectolitres, in London 2·54 hectolitres, in Berlin 2·4 hectolitres, in St. Petersburg 0·67 hectolitre, and in Paris 0.14 hectolitre, at the same date. Revenue is raised from beer in Bavaria by the tax on malt, the barley or malt being measured, the principle being similar to that in force in Great Britain. Uuder the new law of December 8, 1889, a tax of 5s. 10½d. per hectolitre of malt for making either beer or vinegar is levied up to a total of 10,000 hectolitres used, 6s. 1½d. on from 10,000 to 40,000 hectolitres, and 6s. 4¾d. on all amounts over 40,000 hectolitres. There is besides the transit duty from German States of 3s. 2¼d. per hectolitre of beer and 6s. 4¾d. per hectolitre of broken malt for making beer or vinegar. Under the last law the net receipts from this tax in Bavaria amounted to £1,567,614, while in all Germany the receipts were £3,614,926. Bavaria stands at the head of all the hop countries in mass of production, and very nearly at the head in quality. The great increase in hop cultivation, trade, and consumption of late years dates from 1855-60. There were under hops in 1863, 42,627 acres; in 1876, 45,540 acres; and in 1888-89, 62-516 acres. The worst recent harvest was that of 1882, with 2·9 cwt. per acre; and the best that of 1885, 4·09 cwt, per acre. The amount required for home consumption in 1889 was 108,240 cwt., leaving 214,216 cwt. available for export abroad. Bavaria is the largest exporting country, and, next to England. the largest producing country, the former producing in 1889 322,456 cwt. from 62,516 acres, while England produced 497,904 cwt. from 56,833 acres. In England, therefore, a much greater quantity of hops per acre is produced, though the quality is, as a rule, not equal to the Bavarian. The production of brown beer in Bavaria grows at a rate far exceeding the natural increase of population. Taking an average of 17 years (1872-89) there was an average production of 2·47 hectolitres per head per annum. The immense export to North Germany sustains and augments the production; the latter, indeed, would be impossible without the former. This export has trebled in ten years, and at present there are no signs of a falling off even in the rate of increase. The production of beer in North Germany has, indeed, increased very largely of late years, but without prejudice to Bavarian beer, which maintains its popularity. Consumption in Bavaria itself seems only to keep pace with the natural growth of the population.

LIBIOLA COPPER MINING CO.—The directors of the Libiola Copper Mining Company (Limited), have declared an interim dividend of 2s. per share, payable on October 7th.

OIL IN BELOOCHISTAN.—The oil borings in Beloochistan have lately proved very successful. The daily output of oil is doubled, and 35,000 gallons are accumulated at Khattan.

NOTICE.

WE have decided to commence a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

October 7th.—"Manufacturing Smoke."
November 4th.—"Domestic Smoke."
December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the first lecture—"Manufacturing Smoke"—the chair will be taken by Alfred E. Fletcher, Esq., Her Majesty's Chief Inspector of Alkali, &c., Works; and models of various appliances will be exhibited.

Tea and coffee at 6-30 p.m. in the Exhibition room.

As the lecture room was much crowded at our last gathering, many visitors who arrived late being unable to find room, we have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present- After this we shall issue a general invitation, and do our best to accommodate those who accept.

BACK NUMBERS OF THE CHEMICAL TRADE JOURNAL.

NOTICE.

AS we shall shortly clear out our stock of odd numbers of the earlier volumes of the Journal, those of our readers who require back numbers, to complete their sets, should apply for the same not later than October 4th. Some of the numbers are out of print.

Correspondence.

ANSWERS TO CORRESPONDENTS.

G. B.—See our leading article in this issue.

D. S. and Co—No; ferrous sulphate, green copperas, green vitriol, as it is variously called, is the only substance used.

M. H.—Consult a patent agent, by all means.

Alma.—(a). There is a good demand, certainly, we should advise you to put it on the market. (b). Calamine is a carbonate of zinc, and calamine brass was formerly made by using calamine, in place of metallic spelter, calamine is found in North Wales and in Somersetshire.

St. Blazey.—We know nothing of the firm.

Vitæ—We cannot insert verses, even on chemical subjects, try one of the comics.

P., R. H. W., G. A.—Are only admissable as advertisements.

EXPERIMENTS ON GUM ARABIC AND GUM SENEGAL.

GUM arabic is often adulterated with gum senegal, the latter being sometimes sold in its stead. If the gum has not been powdered, the appearance is sufficient to show which variety is chiefly present. Gum arabic forms round or irregular masses, varying in colour from colourless to brown, which reflect light strongly, almost appearing to be crystalline. Gum senegal is usually colourless or pale yellow, with a surface resembling ground glass, the pieces cylindrical or worm-like. It occurs occasionally in round masses resembling a mulberry.

On dissolving either gum in water, only small particles of wood are left, which according to Kramsky, are usually red in the case of gum arabic, but black with gum senegal. Other gums, cherry, for example, are only partially soluble in water, leaving a swollen residue, which only dissolves after long digestion.

With potassium hydrate, and a few drops of copper sulphate solution, both gums give a blue precipitate, which, in the case of gum arabic, is larger in quantity, coherent, and rises to the surface, while the other is more flocculent and remains diffused in the liquid, The precipitates are only slightly soluble on heating, and are not reduced even by boiling. Dextrine yields a similar precipitate, easily soluble on warming, and which is completely reduced on boiling for some time. On prolonged heating with dilute potassium hydrate, solutions of gum arabic and of dextrine become amber coloured, those of Senegal are only slightly coloured.

Mixtures of gum arabic and Senegal behave to the copper test like Senegal alone, but with potassium hydrate they assume the amber colour. Mixtures of gum arabic or Senegal and dextrine with the copper test behave like gum arabic alone, and if the amount of dextrine is not too small, reduction takes place on boiling. When only small quantities of dextrine are present, the copper precipitate after thorough warming may be filtered off, and the filtrate boiled; reduction will then take place. When all three substances are present, the precipitate should be washed, dissolved in dilute hydrochloric acid and a large excess of alcohol added. The precipitated gum is allowed to settle for a day, washed with alcohol, dried and examined as above.

Gum arabic may be systematically examined in the following manner. The powdered substance is mixed with luke-warm water; a gelatinous residue indicates other gums. The aqueous solution is mixed with an excess of potassium hydrate, and a few drops of copper sulphate, warmed and filtered, and the filtrate examined for dextrine by boiling, the precipitate being tested as above.

It is usually stated that gum Senegal is more hygroscopic than gum arabic, but when dried at 103° C., gum Senegal lost 13·39% of water and gum arabic 14·56, and on exposure to moist air for 24 hours, the former gained 6·15%, and the latter 2·24.—*Chem. Zeit.*

PORTLAND CEMENT.

By R. and W. Fresenius.

THE chemical and physical properties of 25 different samples of Portland cement, all of which had passed the German standard, were examined and the results are briefly stated. These brands represent a yearly production of about 6 million casks, and may therefore be regarded as a fair representation of this industry in Germany. They were all examined for

(1) Specific gravity of the ignited and unignited cement,
(2) Loss on ignition,
(3) Alkalinity of aqueous extract,
(4) Reducing power towards potassium permanganate.
(5) Percentage of magnesia.

The sp. gr. of the unignited cements varies between 3·011 and 3·144, and is somewhat smaller than the number which Fresenius had previously obtained (1884), because all these samples were ordered from the firms, and had been stored, a process which is known to diminish the specific gravity.

The sp. gr. of the ignited cements. On ignition, water and carbonic acid are expelled, and the cement is brought back almost into its original condition, so that a measure of the amount of absorption which has taken place is also afforded. Cements made by different methods (washed or made by the dry method) have nearly the same specific gravity, so that the latter seems to depend only on the degree of absorption; it varied from 3·118 and 3·234.

The loss on ignition, which only amounted to as much as 3·371% in one slow-setting cement which had been kept for a long time, varied among the other samples from 0·79—3·114%.

The alkalinity of the aqueous extract varied between 3·00 and 7·20 c.c.

Reducing power towards potassium permanganate. 1 grm. of cement reduced from 0·105 — 2·19 mgrms. The determination of loss on ignition, alkalinity, and reducing power serve in connection with the specific gravity to detect an addition of limestone, hydraulic lime, slag, etc.

The greatest amount of magnesia found was 3·064%, the lowest 0·35%.—From the *Thonindustrie Zeitung.*

Trade Notes.

Fires.—The month seems rather prolific in fires. A most mysterious fire occured a short time ago at the Calder Chemical Works, Castleford, in which some of the sulphuric acid plant was destroyed. On Monday last, a paper mill at Belle Vue, Hartlepool, was destroyed by fire. On the same day, a fire also occurrred at the Briton Ferry Chemical Works, Neath, in which six acid chambers were destroyed, the damage to stock and premises being estimated at £25,000.

Card Index to Periodical Literature.—Visitors to the Permanent Chemical Exhibition will have an opportunity of seeing one of the neat little cabinets of the Newspaper Extract and Special Information Agency. The cabinet contains specimen cards on various subjects, a current index on oxodising agents, and on india-rubber.

The Aluminium Company, Limited.—Last week, the usual general meeting of the Aluminium Company, Limited, was held, and was well attended by the shareholders. The report was adopted after a long explanatory speech from the chairman, Mr. G. W. Balfour, M.P., whose remarks were more particularly levelled against an irresponsible attack in a certain journal. It seems that a fall in the price of the commodity from originally 60s. per lb. to 6s. and 8s., through circumstances which could not be foreseen, has not only largely reduced the value of the company's stock, but has rendered their original method of manufacture obsolete and unprofitable. However, new methods were being perfected by which a great saving in cost was anticipated, and is at present being realised.

Chemical and Copper Workers.—Mr. Cuninghame Graham, M.P., and the Press.—A demonstration was held in the Southport Winter Gardens last week, under the auspices of the St. Helens Chemical and Copper Workers' Union, there being over 2,000 persons present. The Chairman (Mr. P. J. King, president of the Union) said that although only founded ten months ago, the union had a membership ot 5,000 and a fund of over £2,000. Their wages had been raised, their hours of labour shortened, and their position altogether materially improved. Alluding to the strike now going on in St. Helens, he pointed out that if the masters refused to concede the just claims of the men, the union could afford, without soliciting any outside help, to pay each man 16s. per week for twelve months, or even two years, and not a single individual would go to work until every brick in the concern had fallen down. Mr. Cuninghame Graham, M.P., and Mr. John Burns were announced to speak, but, although the meeting assembled at twelve o'clock, neither of these gentlemen put in an appearance till after two o'clock, when Mr. Graham arrived and took a seat on the platform. Addressing the reporters, the Chairman said he had to request them not to report Mr. Graham's speech. If it was their intention to do so, that gentleman declined to speak at all. Mr. Graham said the newspapers would only abuse him, and he preferred they should do so from their own imagination rather than from anything he might say. The reporters then retired from the theatre, where the meeting was held.

Effects of Electricity and Ozone on Milk.—It is well known that during thunderstorms milk tends to grow acid. An Italian, Professor G. Tolomei, has lately tried to throw some light on the nature of this action. He experimented with electricity on fresh milk in three different ways—first, by passing the discharge of a Holtz machine between two balls of platinum inserted nearly two inches apart in a bottle containing milk; second, by sending a battery current between two strips of platinum at the bottom of a U tube holding milk: and, third, by subjecting milk in a test tube to the action of a strong battery current through a silk-covered copper wire wound spirally round the tube. In each case the acidulation was delayed, not hastened. Three equal portions of milk from the same milking, thus treated, began to grow acid on the seventh, the nineth, and the sixth day respectively; while milk not treated with electricity was manifestly acid on the third day. The electrified milk (unlike milk that has been heated to a high temperature, then cooled), coagulates naturally, or by action of rennet, just like ordinary milk. Having thus seen that electricity could not be the direct cause of acidification of milk, the professor next tried the effect of ozone, and found it distinctly acidifying. In one case the surface of a quantity of milk was brought close under the two balls of a Holtz machine, and the milk soon became acid in consequence, the sooner if the discharge was silent (not explosive), in which case more ozone is formed. In another case, ozonized oxygen was made to bubble up through a quantity of milk, which in a few hours was completely acid, and soon coagulated spontaneously. Professor Tolomei is of opinion that oxygen probably also promotes lactic fermentation (a point which has been disputed). If milk keeps longer in wide, shallow vessels, that is probably due, he thinks, to the cooling produced by evaporation, which is favoured by a wide open surface.

Market Reports.

THE LIVERPOOL COLOUR MARKET.

The demand for raw colours has been very steady, and a regular business has been done without much alteration in prices. Ochres: Oxfordshire has been quoted at £10., £12., £14., and £16.; Derbyshire, 50s. to 55s.; Welsh, best, 50s. to 55s.; seconds, 47s. 6d.; and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, little offering, 40s. to 50s.; Devonshire, 50s. to 55s. In white lead, red lead, and oxide of zinc there is no alteration to report in prices. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron, common, £6.; medium, £10.; finest, £20. Vermillionette, 5d. to 7d. per lb.

THE COPPER MARKET.

Messrs. Harrington and Co.'s copper report, dated 16th September, 1890, states:—Chili Copper Charters for first half of September are advised as 2,000 tons fine. The total Charters since 1st January have been 18,700 tons, against 16,400 tons for same time last year. Since our last, the market is again stronger, with good business done in cash, short, and forward prompts, but chiefly in the two last; prices ranging from £60. to £61. 10s. cash, and £60. 7s. 6d. to £62. three months, closing steady at £61. 7s. 6d. and £61. 15s. respectively. The total increase during the fortnight in the Liverpool, Swansea, London, and Havre stocks is 1,750 tons. The present stock of English G.M.B.'s in warehouse, Liverpool and Swansea, is 3,868 tons, against 4,013 tons on 1st ult., showing a decrease of 145 tons. Refined and manufactured sorts are firm. Quotations being—English tough £64. to £65., best selected £67. 10s. to £68. 10s., India sheets £70. to £71., strong sheets £73. to £74., and yellow metal sheets 6½d. per pound. The sales of furnace material comprise at Liverpool—500 tons Argentiferous Montana Matte, December shipment, sold at 11s. 7½d. per unit for copper, with 25 ozs. silver per ton free; 116 tons English precipitate, at 12s. 4¼d.; 1,000 tons ordinary Anaconda, out of old stock, at 12s.; and 300 tons Boston Montana Matte, to arrive, at 11s. 9d. At Swansea—1,400 tons Namaqua ore, to arrive, at 11s. 6d.; and 1,500 tons Quebrada ore out of the Swansea stock, delivered by the Quebrada Company to the Cape Copper Company, at 10s. 9d. per unit. It is reported that the about 3,000 tons Cape Copper Company's best selected, mentioned in our report of the 1st August, has now been disposed of at £66. per ton, this clearing out the accumulated stock which was held on French account.

REPORT ON MANURE MATERIAL.

There has been more business doing, to be attributed, no doubt, to the finer weather and better agricultural prospects, but we have no important alterations in prices to note, either for phosphatic or nitrogenous manure material.

Quotations for mineral phosphates remain as last quoted, with a moderate business passing. Buyers appear to have made up their mind to present range of prices, but they are in no hurry to complete their purchases for the next season's requirements. £5. 11s. 3d. has been paid for a large River Plate cargo of bones, now arrived. For cargoes further off, £5. 12s. 6d. required. £5. 5s., ex-quay Liverpool, readily paid for good clean parcels of grinding bones. For crushed Calcutta bones shortly due £5. 12s. 6d. asked; £5. 11s. 3d. last price paid. Spot price for East Indian bone meal is £5. 17s. 6d. ex-store, and less cannot be quoted for shipment ahead.

Further cargoes of bones are on the market at £5. 7s. 6d. nett cash. Hamburg conditions, delivered U.K. ports, but buyers seem to be scarce.

The nitrate of soda market is very firm at 8s. 4½d. for ordinary, and 8s. 6d. for refined or spot. Ordinary cargoes, due, are worth 8s. 4½d. to 8s. 6d., according to size, and refined would fetch 8s. 9d. per cwt. October-November shipments may be quoted at 8s. 10½d. for ordinary best, 9s. for refined.

Nothing fresh to be reported in dried blood or ammonite.

Supers are very firm at 50s., in bulk, f.o.r. at works, spring delivery, with business thereat.

Kainit may be had at 32s. 6d., in bulk, ex-quay, nett cash.

THE TYNE CHEMICAL REPORT.

TUESDAY.

Chemicals generally have not varied much in price this week, the only exception being caustic soda, which, owing to the strong demand for this article, has had a further rise of 10s. per ton, making an increase of 30s. per ton during the last month. Crystals and ash continue steady, with good demand. Sulphate of soda unchanged, but there are more enquiries in the market. Bleaching powder remains quiet at last week's quotations.

So far as can be learnt here, makers seem to be well satisfied with the result of the meeting of the Leblanc alkali manufacturers, held in Liverpool last Friday, and there seems little doubt now but that the Chemical Union will very shortly be an accomplished fact.

For prompt shipment to-day's quotations are:—Bleaching powder, in softwood casks, £5. 5s. to £5. 10s. per ton; hardwood casks, 5s. per ton extra; caustic soda, 77%, £12 per ton; ground and packed in 3-4 cwt. barrels, £15. per ton; soda ash, 48/52%, 1⅜d. per degree less 5-6%; soda crystals, 56s. per ton; sulphate of soda, in bulk, 30s. per ton; ground and packed in casks, 41s. to 42s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton—all f.o.b. Tyne, or f.o.r. makers' works.

The demand for small coals for manufacturing purposes is well sustained, more especially for export. For Northumberland steam small, prices range from 6s. 9d. to 7s. 3d. per ton, and Durham small, 7s. 6d. to 8s. per ton, according to quality.

THE LIVERPOOL MINERAL MARKET.

The volume of business done this week has been above the average, and prices, in sympathy, have advanced all round. Manganese: Arrivals have somewhat fallen off, but a fair business has been done for spot and forward delivery at full prices. Magnesite: Stocks continue heavy, and prices are in favour of buyers; raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground, £11. Bauxite (Irish Hill brand): An increased business has been done. The production is scarcely able to keep pace with the demand, hence prices have not only maintained their firmness, but in some qualities have advanced; Lump, 21s.; seconds, 17s.; thirds, 13s.; ground, 35s. French Chalk: After a lull in arrivals a fair quantity has arrived this week; the most of it, however, has gone into consumption, at the same time stocks have been drawn from freely, and prices are firm, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes (carbonate) continues easy, selected crystal lump scarce at £6.; No. 1 lumps, 90s.; best, 80s.; seconds and good nuts, 70s.; smalls, 50s.; best ground, £6.; selected crystal ground, £8. Sulphate: In strong demand, especially for tip-top qualities; finest "Angel White" brand (ground), 70s.; seconds, 55s.; thirds, 48s. Pumicestone: More offering, prices easier; ground at £10., and specially selected lump, finest quality, £13. Iron ore offering freely from all points, prices steady. Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore without alteration. Spanish manganiferous ore in fair demand. Emerystone: More arrivals of "off" brands, which are pressing on the market; best brands, however, maintain their prices. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth: A good business doing at full figures; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal: In increased demand at advanced prices. Chrome ore: On account of recent large arrivals, and most manufacturers being overstocked, prices have receded considerably. Antimony ore and metal in strong demand at high prices. Asbestos continues in strong demand, especially rock, and prices very firm. Potter's lead ore of best and standard brands in request; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: In good demand at 65s. to 80s. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar, 50s.; fluorspar, common, 25s.; medium, 40s.; best, £6. to £8. Plumbago steady; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. Founders, £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay quiet—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), finest quality, 22s.

MISCELLANEOUS CHEMICAL MARKET.

The high quotations for caustic soda are maintained owing to the reduction of stocks, but there is no fresh business of importance being done, nor likely to be done until prices have receded from the present abnormal position. Nominally quotations for spot and early deliveries are as follows:—70%, £11. 5s.; 60%, £10. 2s. 6d. to £10. 5s. Cream, 60%, £9. 10s. f.o.b. Liverpool. On the Tyne, 77% is £12. 15s. to £13. per ton. Soda ash is rather firmer, and will, doubtless continue to receive more attention until the caustic soda "squeeze" is over. Bleaching powder has been having a favourable turn, owing to the demand for disinfecting purposes, and prices are firm all round. Softwood on rails at works, £5. 10s. per ton, and hardwood f.o.b., £6. to £6. 2s. 6d. per ton. Soda crystals slightly easier if anything at £2. 17s. 6d. to £3. 2s. 6d. per ton for bags and casks respectively at works. Chlorate of potash still steady at 5d. per lb. Sulphur well sold in all qualities and prices firm. Vitriol and muriatic acids without change. Makers of the latter are comtemplating a reduction from the high price of 10d. per carboy at Widnes and Runcorn as previously quoted for 1891 deliveries. The makers of crystal alum have advanced prices 5s. per ton during the past week, quotations in barrels at Hull being now £5. 2s. 6d. per ton, and at Liverpool £5. 5s. per ton f.o.b. Sulphate of copper firm at £19. 10s f.o.b., and higher prices quoted for forward deliveries. Brown acetate of lime in better demand for spot delivery at £7. to £7. 5s. per ton, according to quality at usual points. Grey acetate of lime scarce at £12. 15s. per ton. Potash caustic and carbonate still in brisk demand, and prices firmly maintained for prompt and forward deliveries. White powdered arsenic continues still in good demand at £13. 10s. per ton. Carbolic acids are only in limited demand, and concessions in price have been made to secure business. Picric acid is stagnant. Prussiate of potash firm in price, and scarce. Chloride of zinc is dearer, and makers well booked with orders.

TAR AND AMMONIA PRODUCTS.

There is no change in the position of the benzol market as far as can be ascertained. Prices remain the same as quoted in last week's *Journal* Solvent naphtha continues in good demand, especially the quality free from odour, while creosote is moving off freely at old prices. Anthracene keeps firm. Sellers are asking 1s. 3d. for B and 1s. 6d. for A. Pitch remains in *statu quo*.

The sulphate of ammonia market has become extremely quiet, the American demand having entirely ceased and Continental buyers seem so far in a comatose condition, the latter having evidently bought a portion of their requirements from the speculators who took the orders some months back at very low prices, and both are now waiting for favourable opportunites for further buying operations. Meanwhile, the market is in a very weak condition, and dealers make very low quotations in the hope of bringing about a decline. The price at Hull is called £11. 10s. to £11. 11s. 3d. At Leith £11. 8s. 9d. to £11. 10s., and at Liverpool £11. 10s. to £11. 12s. 6d. Makers have the future of the market in their own hands, as there is no reason why prices should go lower.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron: Scotch warrants closed at 51s. 3d. cash, and 51s. 6d. one month. Middlesbrough, 47s. 10d. cash; hematite, 58s. 2d. cash. Settlement prices:—Scotch, 51s. 3d.; Middlesbrough, 47s. 10d.; hematite, 58s. 2d. Copper quieter. Chili bars, G.O.B.'s and G.M.B.'s closed at £61. 5s. to £61. 12s. 6d. cash, and £61. 15s. to £62. 2s. 6d. three months. Tin firm: Straits closed at £99. 10s. to £100.; Australian, £99. 12s. 6d. to £100. 2s. 6d. cash, and Straits three months, £98. 10s. to £99. English ingots, £102. to £102. 10s. Lead: Spanish, £13. 12s. 6d.; English, £13. 17s. 6d. to £14. Spelter: Silesian ordinary, £24. 15s. to £24. 17s. 6d. Quicksilver unchanged. Copper shares: Rio Tinto fell $\frac{7}{16}$ to 26$\frac{5}{16}$; Mason and Barry, $\frac{5}{16}$ to 9 $\frac{1}{16}$; Tharsis, ⅛ to 6¼; Cape, Namaqua, and Copiapo, $\frac{1}{16}$ each to 5$\frac{7}{16}$, 3$\frac{7}{16}$, and 3$\frac{7}{16}$ respectively; Libiola, 2$\frac{7}{16}$-½; Panulcillo, 1½-$\frac{7}{16}$.

GLASGOW, WEDNESDAY.—Market firm on ironmasters' threat to damp down furnaces if the men persist in their demands; good business. Scotch done at 51s. to 51s. 4d. cash, also at 51s. 4d. to 51s. 7½d. one month; closing buyers at 51s. 4d. cash, sellers ask ½d. more. Middlesbrough done at 47s. 10d. cash, also at 48s. one month; closing buyers at these prices. Hematite done at 58s. 1d. to 58s. 3d. cash, also at 58s. 4d. to 58s. 6d. one month; closing buyers at 58s. 2d. cash, sellers ask 58s. 4d.

WOLVERHAMPTON, WEDNESDAY.—The revival in the galvanised sheet iron trade was the subject of congratulatory comment on 'Change in Wolverhampton this afternoon. When the year opened, corrugated doubles were £15. 17s. 6d.; they fell to £13. in April, and to £11. 17s. 6d. in July. The Indian and African demand has improved, and consequently this week doubles have been raised to £13. again. Black sheets are £8. for doubles, with a good business. Marked bars firm at £8. 10s.; pigs active, with upward tendency.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The chief feature in the market is perhaps the continued and even accentuated advance in caustic soda, the 70/72° and 60/62° white, and the 60/62° cream, standing at higher figures than at any time for a long period, and the 76° at one which has not been exceeded for at least six months. Sulphate of copper, as anticipated, has further improved its recovery, and to-day quotes at an advance of 10s. Chlorate of potash is firm, and refined alkali has hardened fractionally, but on the other hand bleaching powder is easier a little—but not to any degree worth particular notice. Sulphate of ammonia has been almost stationary at about the quotation of last week, although one or two parcels may have been bought at a little less. The value to-day is about £11. 12s. 6d. f.o.b. Leith. The demand for bichromate of potash and bichromate of soda also has been brisk in the export department for forward deliveries, but the call for home consumption has been very feeble, causing the makers considerable dissatisfaction. As regards the paraffin section, there is no improvement in the position of burning oil, but paraffin scale and wax are both very firm, and if anything stronger. Lubricating oils maintain late position fully also, with some additional advance in the better known brands. Chief prices current are:—Soda crystals, 55s. 6d. net Tyne; alum in lump £5. less 2½%, Glasgow; soda ash, 1⅜d. less 7½%, Tyne; caustic soda, white, 76°, £12. 10s., 70/72°, £11. 5s., 60/62°, £10. 5s., and cream, 60/62°, £9. 5s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s., and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1⅜d., less 1¼% Tyne; saltcake, 32s. 6d.; borax, English refined, £30., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 2s. 6d. to £5. 7s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., and of soda, 2¾d., less 5% and 10% to Scotch and English buyers respectively, delivered (export orders, a farthing less, with potash 8% and soda 7% off f.o.b. Glasgow); chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 4½d. to 8s. 6d.; sulphate of ammonia, £12. 2s. 6d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £19, less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3⅜d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less); ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 6,493 bags.

New Companies.

E. WADE WILTON AND COMPANY, LIMITED.—This company was registered on the 5th inst., with a capital of £2,000., in £50. shares, to acquire the business of a manufacturing chemist, now carried on by E. Wade Wilton, at Batley, Yorkshire, and to extend and develop the same. The subscribers are:—

	Shares.
H. F. Hartman, Bradford, chartered accountant	1
J. Battedfued, Bradford, chartered accountant	1
W. Whiting, Leeds, merchant	1
J. E. Whiting, Leeds, merchant	1
W. E. Wilton, Leeds, woollen buyer	1
Mrs. J. Wilton, Healey, Batley	1
E. Wade Wilton, Batley, manufacturing chemist	1

EASTHOPES, LIMITED.—This company was registered on the 4th inst., with a capital of £10,000., in £1. shares, to purchase the business of Alfred Easthope and Edwin Easthope, cycle manufacturers, painters, paper hanging merchants, oil and colour merchants, and window blind manufacturers, trading both as Easthope Brothers and the Midland Cycle Company. The first subscribers are:—

	Shares.
Alfred Easthope, 24, St. John's-street, Wolverhampton	1
Mary Easthope, 24, St. John's-street, Wolverhampton	1
Edwin Easthope, Adelaide-villa, Finchfield, Wolverhampton	1
Geo. Thos Richardson, 25, West-street, Wolverhampton	1
Albert Alfred Asprey, 55, Wellington-street, Brixton	1
Thos. Enoch Lowe, Queen's-chambers, North-street, Wolverhampton	1

JOHN SMITH AND SONS, LIMITED.—This company was registered on the 4th inst., with a capital of £250,000., in £100. shares, 500 of which are preference shares, to acquire the business of John Smith and Sons of Field Head Mills, Bradford, wool combers and worsted spinners; to carry on the business of wool merchants, wool combers, worsted and woollen spinners, yarn merchants, dyers, grease extractors and mill owners. The first subscribers are:—

	Ord. Shares.	Pref. Shares
Isaac Smith, Field Head Mills, Bradford	10	
John W. Smith, Bradford	1	
Mrs. Smith, Field House, Daisy Hill, Bradford		1
B. Smith, Temple-bank, Bradford		1
John Smith, Bradford		1
J. White, Mornington-villas, Bradford		1
F. White, Farcliffe-road, Bradford		1

JOSEPH YATES AND COMPANY, LIMITED.—This company was registered on the 10th inst., with a capital of £1,320., in £5. shares, to purchase certain letters patent for an appliance to facilitate taking pills. An agreement of the 9th inst., with Joseph Yates, of 308, Pimlico-road, mechanical engineer, regulates the purchase. The subscribers are:—

	Shares.
W. Chapman, 24, Vaughan-road, S.E. licensed victualler	1
A. Gray, 129, Hanover-buildings, Horselydown, engineer	1
T. Cook, 128, Leadenhall-street, merchant	1
H. Bellingham, 20, Clapton-square, N.E.	1
S. Shields, 9, Coleman-street, merchant	1
G. W. Benning, Upton-park, Essex, surveyor	1
W. F. Shields, 9, Coleman-street, merchant	1

OLD HORNCHURCH BREWERY COMPANY, LIMITED.—This company was registered on the 9th inst., with a capital of £45,000, in £5. shares, to acquire and carry on the brewery business of Messrs. Hy. and Benjamin Holmes, at Hornchurch, Essex, trading as the Hornchurch Brewery; and also the business carried on at Horley, Surrey, by Mr. Chas. Dagnall, uuder style of the Horley Brewery. The subscribers are:—

	Shares.
H. Meade King, Bristol, solicitor	1
E. Meade King, Bristol, solicitor	1
C. Dagnall, Horley, brewer	1
A. Harlow, 5, Bishopsgate-street Within, auctioneer	1
W. Ryan, 70, Gracechurch-street, secretary	1
G. Crowden, 32, Ringford-road, S.W.	1
T. Leys, 102, Clarendon-road, W.	1

TYWARDREATH AERATED AND MINERAL WATER COMPANY, LIMITED.—This company was registered on the 9th inst., with a capital of £500 in £1. shares, to trade as mineral and ærated water manufacturers. Registered by Waterlow Bros. and Layton, Limited, Birchin-lane.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

J. PRESTON and J. GRIME, under the style of Preston and Co., Deepley Vale, Nr. Bury, bleachers.

WRIGHT and HANLOW, Bootle, Chamois leather dressers.

BANKS and Co., Wolverhampton, brewers, maltsters, and hop merchants.

J. HOWKER, J. DIXON, R. SIMPSON, and F. SLINGER, under the style of the Savon Soap Co., Burnley, liquid soap manufacturers.

PURTETT and GEORGE, Worle, Somerset, aerated water manufacturers and brewers.

J. LEVER, J. HODGKISS, and R. PENDLEBURY, under the style of the Smallbrook Brick and Tile Co., Westleigh, brick and tile manufacturers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

JOHN VILLIERS EYRE, (trading as Eyre and Co.) Brighouse, mineral water manufacturer.

Ajudications.

JOHN VILLIERS EYRE, (trading as Eyre and Co.), Brighouse, mineral water manufacturer.

The Patent List.

This list is compiled from Official sources in the Manchester Technica Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Substituted Benzidens and Colours therefrom. J. Dawson and R. Hirsch. 13,710. September 1.

Gas or Fluid Compressors. E. Andre. 13,714. September 1.

Medium for using Earth and Chemical Colours.—(Complete Specification.) E. Schmal. 13,719. September 1.

Treatment of Metalliferous Ores.—(Complete Specification.) F. H. Molesworth. 13,723. September 1.

Electro-Metallurgical Apparatus.—C. Hoepfner. 13,735. September 1.

Cheap Method of obtaining Fibres from Esparto and similar Grasses. A. H. Norman. 13,756. September 2.

Rendering Wood highly Inflammable.—(Complete Specification.) J. Gridley 13,767. September 2.

Disinfecting Apparatus. S. Lowe and R. P. Park. 13,783. September 2.

Treatment of Skins and Leather. E. Edwards 13,794. September 2.

Manufacture of Cod Liver Oil.—(Complete Specification.) C. A. Jensen. 13,803. September 2.

Centrifugal Machines..—(Complete Specification.) J. Laidlaw. 13,810. September 3.

Treatment of Substances containing Phosphorus and Aluminium. J. J. Knight and J. W. Bottomley. 13,811. September 3.

Manufacture of Photographic Films. J. J. Acworth. 13,836. September 3.

Steam Boilers. R. Edwards. 13,854. September 3.

Electrical and other Meters. L. Berdon, G. W. Bousfield, and F. Teague. 13,855. September 3.

Prevention of Pores in Molten Metals. F. Burger and R. Mannheimer. 13,856. September 3.

Improvements in Dyeing Apparatus. G. Jagenburg. 13,861. September 3.
Brewing. B. E. R. Newlands 13,862. September 3.
Treatment of Phosphoric Acid for Storage and Transport. B. E. R. Newlands. 13,863. September 3.
Substitute for India-rubber and Leather. A A. Blandy. 13,864. September 3.
Evaporation of Brine. J. E. Bennett. 13,871. September 4.
Brick-Making Machinery. J. Salt. 13,882. September 4.
"Metal Fuel" for Gas Fires. A. Sweet. 13,883. September 4.
Paste or Soap for Removing Grease. D. Rossi 13,891. September 4.
Electric Welding.—(Complete Specification.) M W. Dewey. 13,905. September 4.
Electric Welding.—(Complete Specification.) M. W. Dewey. 13,906. September 4.
Production of Sulphite and Hypo-Sulphite of Soda. T. Ellershausen. 13,929. September 4.
"Heating and Increasing the Volume of Feed Water in connection with Steam Engines." A. Machaine. 13,946. September 5.
Improved "Patent" Fuel. F. S. Craig and W. J. Cowden. 13,962. Sept. 5.
Manufacture of Soap. G. P. Clarke. 13,984. September 5.
Soap Powders.—(Complete Specification.) G. P. Clarke. 13,985. Sept. 5.
Animalizing Cotton and other Vegetable Fibres. S. Pitt. 13,997. September 5.
Furnaces for Concentrating Sulphuric Acid.—(Complete Specification.) C. Négrier. 14,022. September 6.
Apparatus for Disinfecting J. Laws and F. J. Emerson. 14,024. Sept. 6.
Apparatus for Loading Coke from Ovens into Waggons. A. M. Chambers and T. Smith. 14,034. September 6.
Distillation of Carbonaceous Matter. L. H. Armour. 14,052. Sept. 6.
Smelting Furnaces.—(Complete Specification.) F. A. Herbertz. 14,053. September 6.
Apparatus for the Evaporation of Solutions.—(Complete Specification.) H. E. Hansen. 14,059. September 6.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Sept. 6th.

Ammonia—
Holland, £84 Weatherley, Mead & Co.

Antimony Ore—
Sydney, 27 t. Bank of N.S. Wales
Italy, 44 Major & Field
Sydney, 10 Lark, Son & Co.
N. Zealand, 27 N. Z. Antimony Co.
" 48 J. B. Cree
Portugal, 8 Coverley & Westray
Germany, 45 Cookson & Co.

Acetic Acid—
Holland, 195 pks. A. & M. Zimmermann

Alumina Sulphate—
Holland, £140. R. W. Greef & Co.

Bromine—
Germany, £580 A. & M. Zimmermann
" 100 "

Barytes—
Belgium, 21 cks. W Harrison & Co.
" 43 Hemmingway & Co.
" 21 R. Braithwaite & Co.
" 22 E. W. Carling & Co.
" 21 Prps. of Scott's Wf.
" 21 R. Braithwaite & Co.
Holland, 40 "
Germany, 24 O'Hara & Hoar
" 44 W. Harrison & Co.

Brimstone—
Italy, 35 t. G. Boor & Co.
" 100 Johnson & Hooper
" 5 Jessop & Co.
" 10 B. Jacob & Sons
" 200 W. C. Bacon & Co.
" 100 Soundy & Son

Caoutchouc—
Germany, 3 c. Pickford & Co.
Tamatave, 4 L. & I. D. Jt. Co.
U. S., 3 "
E. Indies, 27 Prop. Bull Wf.
" 15 Ross & Deering
Singapore, 266 L. & I. D. Jt. Co.

Cream of Tartar—
Holland, 20 pks. Middleton & Co.
France, 5 C. F. Gerhardt
" 10 B. & F. Wf. Co., Ld.
" 1 E. W. Carling & Co.
" 15 B. & F. Wf. Co., Ld.
" 5 C. F. Gerhardt
Spain, 10 B. & F. Wf. Co., Ld.
Italy, 20 "
" 10 D. Taylor & Sons

Cobalt Ore—
Belgium, 28 t. Newcomb & Son

Caustic Potash—
France, 14 pks. Spies Bros. & Co.
" 17 Petri Bros.
" 26 Beresford & Co.

Chemicals *(otherwise undescribed)*
Germany, £15 T. H. Lee
Holland, 20 Beresford & Co.
" 22 Phillipps & Graves
Norway, 86 J. Kitchin, Ld.
Holland, 25 R. Morrison & Co.
Germany, 78 T. H. Lee
" 42 Phillipps & Graves
" 522 A. & M. Zimmermann
Holland, 75 Beresford & Co.

Dyestuffs—
Indigo
Holland, 4 chts L. & I. D. Jt. Co.
E. Indies, 26 Barr, Moering & Co.

Dyestuffs—*continued.*
Myrabolams
E. Indies, 195 pks. Beresford & Co.
" 400 Lewis & Peat
" 342 Hoare, Wilson & Co.
Sumac
Italy, 300 pks. Hicks, Nash & Co
" 550 W. France & Co.
" 300 Beresford & Co.
" 1,000 Brown & Elmslie
" 1,500 W. Shelcott
" 20 Baxter & Hoare
Tanners' Bark
Natal, 5 t. Dyster, Nalder & Co.
France, 5 Arnati & Harrison
Durman, 2 L. & I. D. Jt. Co.
Holland, 10 G. S. N Co.
Melbourne, 61 Leach & Co.
Sydney, 90 Hicks, Nash & Co.
Adelaide, 21 L. & I. D. Jt. Co.
Belgium, 10 G. S. N. Co.
Sydney, 13 Flack, Chandler & Cc.
France, 20 cks. Union Lighterage Co., Ld.
U. S., 11 t. A. J. Humphrey
Cochineal
Canaries, 63 pks. W. H. Cole & Co.
" 30 W. M. Smith & Sons
Gambier
Singapore, 260 pks. L. & I. D. Jt. Co
" 848 Adamson, Gilfillan & Co.
" 37 Lewis & Peat
Dyestuffs *(otherwise undescribed)*
Canaries, 10 pks. Kuhner, Henderson & Co.
Italy, 700 J. Kitchin, Ld.
Valonia
Holland, 73 t. J. Graves
Extracts
France, 4 pks. Mory & Co.
Germany, 210 A. J. Humphrey
France, 7 T. H. Lee
U. S., 54 W. Burton & Sons
France, 235 L. J. Levinstein & Sons
Belgium, 1 Pickles Bros.

Glycerine—
Holland, £105 Phillipps & Graves
France, 595 Ross & Deering
Germany, 70 Beresford & Co.
" 60 H. Lambert
" 60 "
Holland, 450 Spies Bros. & Co.
Germany, 60 Beresford & Co.

Gutta Percha—
Germany, 2 c. T. H. Lee
" 1 Kaltenbach & Schmitz
France, 4 Flageollet & Co.
Singapore, 39 Kaltenbach & Schmitz

Glucose—
Germany, 200 pks. 200 cwts. J. Barber & Co.
France, 100 100 "
" 190 190 Barrett, Tagant & Co.
" 100 100 Dutrulle & Co.
" 200 200 De Pavia Norman & Co.
U. S. 250 250 L. & I. D. Jt. Co
" 1,000 1,000 T. C. Howell
Germany, 200 200 Baxter & Hoare
" 100 100 Botolph & Nich's Whvs. Co., Ld.
" 200 200 J. F. Ohlman
U.S. 100 600 Prps. Scott's Wf.
" 250 250 J. Barber & Co

Iron Bromide—
Germany, £100 A. & M. Zimmermann

Isinglass—
N. Russia, 1 pkg. J. Vickers
" 2 M. D. Co.
Montreal, 3 Hudson's Bay Co.
E Indies, 5 L. & I. D. Jt. Co.

Kali—
Germany, £48 Spies Bros. & Co.

Lead Acetate—
Germany, £50 Petri Bros.

Manure—
France, 190 t. Lawe's Manure Co Ltd.
Holland, 30 T. Farmer & Co.
" 400 Anglo-Cntntl. G. Wks.
Belgium, 125 F. C. Hill & Co.
Holland, 50 Anglo-Cntntl. G. Wks.
Germany, 165 "
Belgium, 230 Lawe's Chemi Manure Co.

Manganese Ore—
China, 5 t. L. & I. D. Jt. Co.

Potassium Sulphate—
France, 17 pks. Weatherley Mead & Co.
Germany, 60 Petri Bros.
France, 14 Weatherley Mead & Co.
" 11 Petri Bros

Potassium Prussiate—
Germany, £260 A. & M. Zimmermann

Pearl Ashes—
France, 200 c. F. W. Berk & Co.

Permanganate—
France, £36 Spies Bros & Co.

Plumbago—
E. Indies, 30 brls. H Johnston & Sons
" 310 Prop. Chamberlain's Wf.
Germany, 122 Brown & Elmslie
E. Indies, 97 Thredder Son & Co.

Potash—
France, £85 E. W. Carling & Co.

Pitch—
N. Russia, 470 brls. C. S. Lovell
" 620 cks. W. F. Malcolm & Co.

Pyrites—
Pomaron, 1,050 t. Mason & Barry, Ld.

Paraffin Wax—
U.S., 200 brls. H. Hill & Sons

Sulphuric Acid—
Holland, 1 pk. G. N. Rly Co.
" 1 Brasch, & Rothenstein

Saltpetre—
Germany, 80 cks. J. Hall & Son
" 35 P. Hecker & Co.
" 20 bgs. Union Ltge. Co., Ltd.
E. Indies, 2,046 C. Wimble, & Co.
" 619 L. & I. D Jt. Co.

Sodium Acetate—
Germany, 34 pks. C. Smith
Holland, 3 Lister & Biggs
France, 10 Prop. Hays' Wf.

Stearine—
France, 102 sks. Beresford & Co.
U.S. 100 lbs. L & I. D. jt. Co.
Belgium, 125 bgs. H. Hill & Sons
U.S., 180 cks. A. A. Elliott

Sugar of Lead—
Germany, £250 Beresford & Co.

Turpentine—
France, 15 cks. T. Trapp & Sons

Tartar Salts—
France, 3 pks. Petri Brs.

Tar—
N. Russia, 2250 brls. Linck Moeller & Co.

Tartaric Acid—
Holland, 28 pks. Middleton & Co.
" 84 F. W. Heilgers & Co.

Ultramarine—
Belgium, 5 cs. Leach & Co.
" 5 W. Harrison & Co.
" 10 Hernu Peron & Co.
Holland, 6 cks. Ohlenschlager Brs.
" 7 Phillipps & Graves
Germany, 1 cs. H. J. Perlbach & Co.
Holland, 5 cs. Little & Johnston
" 10 Hernu Peron & Co.
" 20 brls. Little & Johnston

Zinc Oxide—
Holland, 50 cks. Prprs. of Dowgate Dk.
" 50 brls. M. Ashby, Ld.
Germany, 60 "
" 20 J. Matten
" 5 Gerard Bros. & Co.
Holland, 75 M. Ashby, Ld.

LIVERPOOL.

Week ending Sept. 9th.

Acetate of Lime—
New York, 423 bgs. R. Preston & Co.
" 898 "
St. Nazaire, 84 sks.

Bones—
New York, 335 sks.
Carrizal, 637 bgs. Balfour, Williamson, & Co.

Bleaching Powder—
Rouen, 24 cks. Co-op. Wh'sale Society

Carbolic Acid—
Rotterdam, 3 cks.
Rouen, 9 cs. Co-op. W'sale Society

Carbolic Solid—
Havre, 60 btls. Cunard S. S. Co. Ltd.

Cream of Tartar—
Rotterdam, 6 cks.
Tarragona, 2
" 5 Sachse & Klemm
Patras, 5 brls. Cursi, Raftopato, & Co
Bordeaux, 3 cks.

Charcoal—
Rotterdam, 105 bgs.

Copper Ore—
A. Baker, 198 brls.

Chemicals *(otherwise undescribed)*
Rotterdam, 5 cks.
Hamburg, 4 cs.
Rouen, 99 cks. Co-op. W'sale Society.

Dyestuffs—
Valonia
Smyrna, 73 bgs. Ch. L. Nicoliade
" 200 t.
Madders
Smyrna, 32 bls.
Extracts
New York, 6 brls. B. Wilkinson & Son
" 5
Philadelphia, 100 bxs.

Dyestuffs—*continued.*
Orchella
Lisbon, 26 bls. A. Barbosa & Co.
Argols
Oporto, 23 cks. German Bank London
Divi divi
681 bgs.
Logwood
Zunas de Zazas, 121 t. Farnworth & Jardine
Black River, 342 E. Brownbill & Co.
Saffron
Valencia, 2 cs.
Epsom Salts—
Hamburg, 10 cs.
Glycerine—
Rotterdam, 10 crbys.
Graphite—
Hamburg, 2 cks.
Glucose—
Stettin, 12 cks. 200 bgs.
Hamburg, 44
,, 5
Philadelphia, 25 brls.
Horn Piths—
Lisbon, 4 t.
Isinglass—
Maranham, 6 pks. Gunston, Sons & Co.
Manure—
Phosphate Rock
Coosaw River, 1,250 t.
Manganese Ore—
Carrizal, 550 t.
Coquimbo, 500
Manganese—
Hamburg, 1 cs.
Naphtha—
New York, 5,183 brls.
Potash Salts—
Hamburg, 536 bgs.
Paraffin Wax—
New York, 260 brls. H. Hill & Son
Phosphate—
Ghent, 600 bgs.
Montreal, 100 t. A. Hunter
,, 250 Canadian Phosphate Co.
Potash—
Stettin, 1 ck. C. W. Field
Rouen, 43 42 dms. Co-op. W'sale Society
Hamburg, 100 bgs.
Pitch—
Bordeaux, 33 cks.
Pyrites—
Stettin, 1 ck. G. G. Blackwell
Huelva, 973 t. Matheson & Co.
,, 1,967 ,,
Sulphur Ore—
Huelva, 1,446 t. Matheson & Co.
Sodium Acetate—
Rouen, 9 cks. Co-op. W'sale Soc.
,, 9 ,,
Sodium Nitrate—
Iquique, 1,390 bgs. Cockbain, Allardice & Co.
Salt—
Hamburg, 100 t.
Saltpetre—
Hamburg, 4 cks.
,, 100
Tartar—
Bordeaux, 92 cks.
Ultramarine—
Rotterdam, 2 cs. 40 brls.
Hamburg, 12
Zinc Oxide—
Terneuzen, 85 cks.

HULL.

Week ending Sept. 11th.

Acid *(otherwise undescribed)*
Hamburg, 17 cks. Barton & Roberts
Amsterdam, 23 cks. W. & C. L. Ringrose
Alumina—
Rotterdam, 40 cks. W. & C. L. Ringrose
Albumen—
Rouen, 3 cs. Rawson & Robinson
Ammonia—
Harlingen, 1 cs.
Copper Ore—
Seville, 1,290 t.
Cellulose—
Christiania, 400 brls. W. H. Wheelwright
Chemicals *(otherwise undescribed)*
Antwerp, 5 cks. Wilson, Sons, & Co.
Rotterdam, 5 G. Lawson & Sons
Bremen, 1 Veltmann & Co.
Rotterdam, 6 pks. W. & C. L. Ringrose
Dyestuffs—
Valonia
Smyrna, 200 t.
Rennet
Bremen, 15 bgs. J. R. & A. Mayfield
Alizarine
Rotterdam, 40 cks. Hutchinson
,, 11 pks. W. & C. L. Ringrose
,, 2 cks. ,,
,, 1 cs. Hutchinson & Son
,, 35 pks. W. & C. L. Ringrose
,, 42
Madders
Marseilles, 3 cks.
Rotterdam, 8 W. & C. L. Ringrose
Sumac
Bordeaux, 100 bls. Rawson & Robinson
Trieste. 40 bgs. Wilson, Sons & Co.
Fiume, 50 ,,
Palermo, 970 ,,
Ferro Chrome—
Rotterdam, 2 cks. Hutchinson & Son
Glucose—
New York, 20 brls.
Rotterdam, 40 bgs. Hutchinson & Son
Stettin, 800 C. M. Lofthouse & Co.
,, 25 cks.
Gutta Percha—
Hamburg, 3 cs. Bailey & Leetham
Glycerine—
Rotterdam, 10 cs. W. & C. L. Ringrose
Manure—
Ghent, 160 t. Wilson, Sons, & Co.
Potash—
Rotterdam, 42 cks. G. Lawson & Sons
Phosphorus—
Rouen, 150 cs. Wilson Sons, & Co..
Phosphate—
Ghent, a quantity. Wilson, Sons, & Co.
Sulphate—
Hamburg, 1 cs. C. M. Lofthouse & Co.
Saltpetre—
Hamburg, 42 brls.
Stearine—
Rotterdam, 30 bgs. Wilson, Sons, & Co.
Sulphur—
Catania, 3,294 pks. Wilson Sons & Co.
Messina, 8 cs ,,
Tar—
Stockholm, 80 brls. Wilson, Sons, & Co.
Turpentine—
Bordeaux, 30 cks. Rawson & Robinson
Ultramarine—
Rotterdam, 6 cks.

GLASGOW.

Week ending September 11th.

Aluminium—
Antwerp, 8 cs.
Barytes—
Rotterdam, 251 cks. J. Rankine & Son
Chemicals *(otherwise undescribed)*
Rotterdam, 1 cs. J. Rankine & Son
Christiania 1 ck.
Hamburg, 5 cs.
Extracts
Antwerp, 4 cks.
Madders
Rotterdam, 4 cks. J. Rankine & Son
Alizarine
Rotterdam. 39 cks. 4 cr. J. Rankine & Son
,, 20 cs.
Argols
Bordeaux, 91 bgs. J. & P. Hutchinson
Glycerine—
Rotterdam, 10 bllns. J. Rankine & Son
Sodium Sulphate—
Antwerp, 40 cks.
Stearine—
Antwerp, 63 bgs.
Tar—
Antwerp, 21 cks.
Tartar—
Bordeaux, 6 cks. J. & P. Hutchinson
,, 13
Oporto, 3 cks.
Ultramarine—
Antwerp, 10 cs.
Rotterdam, 4 cks. J. Rankine & Son
Waste Salt—
Hamburg, 100 t. 133 cks.
Zinc Oxide—
Antwerp, 85 cks.

GOOLE.

Week ending Sept. 3rd.

Alum—
Rotterdam, 56 cks.
Barytes—
Rotterdam, 11 cks.
Dyestuffs—
Indigo
Rotterdam, 13 chts.
Alizarine
Rotterdam, 61 pks.
Madders
Rotterdam, 3 cks.
Extracts
Hamburg, 24 cks.
Logwood
Belize, 830 t.
Dyestuffs *(otherwise undescribed)*
Antwerp, 38 cks. 50 bgs.
Glucose—
Hamburg, 16 bgs.
Calais, 200
Naphthylamine—
Rotterdam, 3 cks.
Potash—
Hamburg, 12 cks.
Dunkirk, 89 21 drms.
Sulphur—
Antwerp, 40 bgs.
Sugar of Lead—
Hamburg, 13 brls.
Saltpetre—
Hamburg, 4 cks.
Waste Salt—
Hamburg, 610 bgs. 631 cks.

TYNE.

Week ending September 10th.

Copper Precipitate—
Pomaron, 1,863 bgs. Mason & Barry
Glycerine—
Hamburg, 11 pks. Tyne S.S. Co.
Glucose—
Hamburg, 3 cks. Tyne S.S. Co.
Saltpetre—
Hamburg, 90 t. Clephens & Wienike
Sulphur Ore—
Ponaron, 1,120 t. Mason and Barry
Zinc Oxide—
Antwerp, 10 brls. Tyne S S. Co.

GRIMSBY.

Week ending September 6th.

Albumen—
Antwerp, 7 pks.
Glucose—
Hamburg, 180 bgs.
Manure—
Antwerp, 20 pks.
Zinc Ashes—
Antwerp, 15 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Sept. 3rd.

Ammonium Carbonate—

Dunkirk,	18 c.	£26
Yokohama,	1 t.	38
New York,	82 cks.	515
Amsterdam,	12	20
Melbourne,	20 cs.	96

Ammonium Sulphate—

Rotterdam,	25 t. 11 c.	£298
Malmo,	10 5	122
Antwerp,	30 16	330
Emmerich,	122	1,464

Arsenic—

Wellington,	2 t.	£32
Napier,	5 12 c	85
St. Petersburg,	27 cks.	98
Sydney,	1 t.	15
Brisbane,	1 3 c.	17

Alum Cake—

Melbourne,	8 t. 16 c.	£25

Acids *(otherwise undescribed)*

Cologne,	170 btls.	£268
Auckland,	8 cs.	25

Benzol—

Rotterdam,	9 t. 10 c.	£400

Cream of Tartar—

Canterbury,	10 c.	£52
Melbourne,	1 t.	103
,,	2	202
,,	1	103

Carbolic Solid—

Yokohama,	1 t. 3 c.	£109
Rotterdam,	7 2	402
Barcelona,	10	42
Antwerp,	24 drs.	403
New York,	5,820 lbs.	222

Carbolic Acid—

Napier,	250 gls.	£49
Calcutta,	20 drs	17
Adelaide,	2 t.	12

Copperas—

Batavia,	100 cks.	£26

Copper Sulphate—

Melbourne,	5 t. 16 c.	£109
Bombay,	5	115
Adelaide,	5	96
Canterbury,	1	19
Sydney,	1 2	22
Antwerp,	5	85
Melbourne,	5	85
Calcutta,	10 cs.	30

Caustic Soda—

Lyttelton,	5 t.	£52
Batoum,	84 15 c.	940
Mahé,	7 5	82
Hong Kong,	13	16

Citric Acid—

St. Petersburg,	6 kgs.	£43
,,	10 c.	76
Hamburg,	22 cks.	159
Brussels,	10	80

Citric Acid—*continued.*

Rotterdam,	5	£58
Trieste,	5	40
Paris,	5	40
Toronto,	5	37
Hamburg,	45 kgs.	223
Barcelona,	3 t. 10 cks.	928

Coal Products—
Pitch

Cette,	1,150 t.	£2,568
St. John's,	70 brls.	21
Boston,	282	127
Odessa,	200	60

Tar

St. John's,	75 pks.	34

Benzole

Hamburg,	18 drms. 5 pns.	406
Rotterdam,	32 20	765
,,	47 cks.	338

Naphthaline

Hamburg,	286 bgs.	70

Anthracene

Rotterdam,	103 cks.	600

Chemicals *(otherwise undescribed)*
Adelaide, 13 pks. £26
Melbourne, 4 33
Disinfectants—
Alexandria, 3,600 gls. £380
Karachi, 14 pks. 22
Sydney, 30 cks. 59
Guano—
Berbice, 15 t. 6 c. £161
Demerara, 30 300
Morlaix, 145 1,450
Horn Waste—
Brussels, 18 t. £35
Muriatic Acid—
Antwerp, 4 t. 10 c. £30
Manure—
Danzig, 200 t. £980
Malmo, 97 10 c. 275
Hamburg, 20 80
Havre, 120 966
Penang, 5 65
Hamburg 100 1,200
Stettin, 48 15 168
Barbadoes, 150 1 1,490
Bordeaux, 19 19 105
Auckland, 130 600
Rouen, 40 160
Dunkirk, 24 114
Rouen, 21 252
Tarragona, 14 8 120
Stettin, 9 17 48
Hamburg, 295 11 1,800
Auckland, 200 1,313
Nitric Acid—
Jersey, 24 crbys. £43
Oxalic Acid—
Antwerp, 8 t. 5 c. £250
Phosphate—
Treport, 25 t. £185
,, 25 182
Potassium Sulphate—
Philadelphia, 40 t. £472
Potassium Chlorate—
New York, 22,400 lbs. £443
Melbourne, 1 t. 45
Saltpetre—
Adelaide, 1 t. £21
Newcastle, 1 22
Syra, 4 96
Oporto, 7 7 c. 150
Cadiz, 2 10 54
Melbourne, 1 10 33
Valencia, 1 10 32
Santos, 4 18 113
Salammoniac—
Calcutta, 2 cks. £8
Sanitas Powder—
Bombay, 12 t. 1 c. £120
Sulphuric Acid—
Cape Town, 3 t. 19 c. £14
Sulphur Flowers—
Blenheim, 2 t. £18
Sheep Dip—
Algoa Bay, 50 cs. £140
Lyttelton, 11 t. 3 c. 550
M. Video, 13 11 500
Soda Crystals—
New Orleans, 21 t. 14 c. £100
Tartaric Acid—
Adelaide, 2 t. £264
Canterbury, 5 c. 34
Wellington, 7 45

LIVERPOOL.

Week ending September 6th.

Alkali—
Rotterdam, 27 cks.
San Francisco, 73
Palermo, 1 t. 14 c. £39
Ammonium Carbonate—
Genoa, 1 t. £42
Montreal, 10 c. 1 q. 17
Rotterdam, 16 14
Salonica, 3 1 7
Ammonium Muriate—
Philadelphia, 21 t. 19 c. £498
Acetic Acid—
Lisbon, 17 c. £7
Porto Alegre, 2 11
Ammonium Sulphate—
New York, 25 t. 4 c. £280
Antwerp, 20 5 243
New York, 32 384
Stettin, 50 9 3 584
Valencia, 31 372
Gr. Canary, 20 8 235
Ammonia—
Cape Town. 3 c. £5
New York, 4 t. 17 139
San Nicholas, 2 19 141
Alum—
Seville, 2 t. 3 c. £11
Pernambuco, 2 3 11
Galatz, 3 16 20
Valencia, 5 10 26
Bordeaux, 4 19 24
Stockholm, 14 6 42
Madras, 4 21
Galatz, 1 3 5
Valencia, 4 21
Catania, 1 19 2 9
Antimony—
Odessa, 5 t. 3 q. £365
Santos, 12 26
Bone Waste—
Rouen, 9 t. 5 c. £47
Bleaching Powder—
Boston, 516 cks. 83 tcs.
Genoa, 12
Hamburg, 82
New York, 139 84
Rouen, 101
Antwerp, 25 brls.
Boston, 501 cks. 93 tcs.
Colombo, 3
Ghent, 100
Hamburg, 43
Montreal, 22
Naples, 52
New York, 107
Philadelphia, 50 pns.
Yokohama, 100 cs.
Corunna, 8 cks.
Borax—
Adelaide, 12 c. £16
Antwerp, 9 cks. 37
Malaga, 5 c. 2 q. 8
Antwerp, 10 2 14
Rotterdam, 3 1 85
Boracic Acid—
Stockholm, 6 t. £180
Borate of Lime—
Rouen, 1 t. £13
Copperas—
Samarang, 33 t. 10 c. 2 q. £59
Galatz, 3 3 1 9
Beyrout, 3 7
St. John, N.B., 2 t. 13 c. 3 q. £9
Caustic Soda—
Alexandria, 16 dms.
Antwerp, 8
Baltimore, 200
Beyrout, 35
Boston, 589
Calcutta. 78
Carthagena, 10 25 brls.
Ceara. 30
Fiume, 107
Genoa, 123
Ghent, 18
Gothenburg, 43
Hamburg, 5
Havana, 85 pks.
Leghorn, 10
Lisbon, 47
Maceio, 30
Malaga, 8 brls.
Maracaibo, 10
Montreal, 125 38 cks.
Nantes, 15
Naples, 32
New York, 628
Oporto, 42
Piræus, 15
Port Louis, 9
Rouen, 30
St. John's, N.B., 30
Santander, 24
Savanilla, 25
Singapore, 30
Stettin, 25 15 brls.
Tampico, 200 kgs.
Valencia, 48
Valparaiso, 25
Vigo, 13 brls.
Yokohama, 36
Alexandria, 18
Amsterdam, 24
Antwerp, 7
Barcelona, 10 60 brls.
Bombay, 37
Boston, 200
Cardenas, 30
Carthagena, 65
Ceara, 30 kgs.
Colombo, 24
Galatz, 32
Genoa, 102
Havana, 130
Leghorn, 50
Lisbon, 60
Caustic Soda—*continued.*
Maceio, 2 dms.
Malta, 10
Melbourne, 108
Montreal, 50
Naples, 25
New Orleans, 150
New York, 700 50 pks.
Odessa, 25
Panama, 15
Pasages, 15
Penang, 120
Philadelphia, 200 135 brls.
Rangoon, 10
Salonica, 14
Savanilla, 20
Seville, 300 125
Trieste, 14
Valparaiso, 25
Venice, 20
Vigo, 30
Yokohama, 143
Shanghai, 35
Calcium Chlorate—
New York. 4 t. 5 c. £9
Calcined Magnesia—
Genoa, 84 lbs. £100
Copper Sulphate—
Piræus, 1 t. £18
Rotterdam, 1 17 c. 2 q. 34
Rouen, 5 12 137
Antwerp, 3 3 54
Barcelona, 4 16 85
Santos, 1 19 40
Naples, 1 2 19
Montreal, 6 2 2 109
Bombay, 1 5 22
Rosario, 2 6 39
M. Video, 1 3 19
Hamburg, 10 3 186
Montreal, 4 14 99
Nantes, 26 9 664
Palermo, 2 10 3 44
Genoa, 6 9 3 140
Ancona, 5 13 2 102
Bari, 4 10 81
Beyrout, 9 8
Genoa, 1 2 3 20
Venice, 5 2 11
Calcutta, 5 88
Stettin, 10 2 173
Talcahuano, 2 6 3 41
Oporto, 5 1 2 90
Amsterdam, 3 3 60
Alexandria, 1 1 18
Ancona, 1 6 1 24
Calcutta, 1 5 23
St. John's, 13 3 15
Rouen, 5 12 137
Bombay, 7 10 165
Beyrout, 8 2 9
Santander, 10 3 185
Lisbon, 7 2 130
Genoa, 3 11 2 65
Hamburg, 10 3 210
Smyrna, 10 1 9
Venice, 7 14 1 135
Stettin, 2 8 2 45
Galatz, 1 18
La Union, 2 45
Odessa, 2 3 36
Talcahuano, 17 3 14
Marseilles, 110 6 1,980
Melbourne, 10 182
Nantes, 5 1 3 95
Bari, 4 16 90
Montreal, 6 1 3 109
Palermo, 1 1 1 20
Naples, 17 14 1 303
Antwerp, 7 16 3 140
Rouen, 112 15 2,030
Hamburg, 7 10 2 135
Stettin, 1 2 20
Catania, 2 1 2 35
Messina, 5 1 3 91
Catania, 15 9 285
Genoa, 2 11 1 45
Odessa, 3 4 1 58
Carbolic Acid—
Havre, 10 c. £38
Hamburg, 5 3 q. 31
Philadelphia, 1 t. 7 71
Rouen, 1 2 95
New York, 3 2 241
Bombay, 1 3 19
Charcoal—
Montreal, 2 t. 13 c. 1 q. £12
Chemicals *(otherwise undescribed)*
Sierra Leone, 2 drs. £5
Dried Blood—
Rouen, 30 t. 17 c. £220
Disinfectants—
Calcutta, 2 cs. £39
Epsom Salts—
Bombay, 100 kgs. 250 cks.
Epsom Salts *continued.*
Halifax, 25 brls.
Rio de Janeiro, 120 kgs.
Santos, 27
Sierra Leone, 5 cs.
Glycerine—
Boston, 9 c. 3 q. £27
New York, 50 t. 1,400
,, 25 3 2 56
Guano—
Bilbao, 1 t. 10 c. 1 q. £14
Gr. Canary, 1 10 1 14
Lead Nitrate—
Genoa, 6 c. £3
Manure—
Las Palmas, 3 t. £18
Antwerp, 5 1 c. 2 q. 23
Havre, 50 4 2 230
New York, 1 5 5
Rochefort, 409 5 3 1,792
Marseilles, 177 6 3 969
Muriatic Acid—
Santos, 6 t. £7
Nitric Acid—
Santos, 6 t. £14
Oxalic Acid—
St. Petersburg, 8 t. 19 c. £240
Amsterdam, 7 13
Melbourne, 1 t. 2 1 q. 37
Pitch—
Cette, 1,421 t.
Iquique, 15 brls.
Monte Video, 30
Sherbro, 5
Potassium Stannate—
Bombay, 12 c. £40
Potassium Carbonate—
Bombay, 3 c. £7
Montreal, 2 t. 16 67
Phosphate—
Hamburg, 10 t. 5 c. £50
Potassium Bichromate—
Alexandria, 3 c. £6
Bombay, 1 t. 5 47
Cadiz, 3 5
Alexandria, 12 21
Santos, 7 cks. 35
Smyrna, 16 29
Potassium Nitrate—
Gr. Canary, 2 t. 1 c. 2 q. £26
Potassium Chlorate—
Alexandria, 1 t. £49
Ancona, 10 c, 23
Bari, 10 23
New York, 5 333
,, 15 650
Calcutta, 2 cs. 11
Havana, 1 10 63
Malaga, 2 5
Oporto, 1 47
New York, 5 204
Gothenburg, 33 1,446
Hamburg, 13 33
Santos, 12 30
Potash—
Rouen, 3 t. 5 c. £65
Leghorn, 1 8 32
Sodium Bichromate—
Salonica, 13 c. 2 q. £14
Soda Crystals—
Alexandria, 32 brls.
Boston, 280
Gibraltar, 10
Honolulu, 20
Pernambuco, 200
Boston, 280 cks. 500 kgs.
Calcutta, 3
Colombo, 2
Gibraltar, 100
Malta, 100
Philadelphia, 167
Salt—
Antwerp, 268 t.
Baltimore, 99
Calcutta, 3,215
Detroit, 65
Frederico, 800
Ghent, 193
Halifax, 381
Iceland, 120
Lagos, 5
Manaos, 6
New York, 735
Old Calabar, 180
Pensacola, 400
Pillan, 900
Rio de Janeiro, 1
St. Johns, 750
San Francisco, 93 12 c.
Savannah, 1,345
Trinidad, 62½
Ukaka, 7½
Westervick, 400

Salt—*continued.*
Calcutta, 7,569 t.
Adelaide, 385
Boston, 300
Brisbane, 25
Cameroons, 43
Chicago, 200
Ghent, 150
Gothenburg, 40
Halifax, 9
Mauritius, 50
Montreal, 461
St. John, N.B. 459
New Orleans 65

Sodium Bicarbonate—
Antwerp, 10 cks.
Amsterdam, 20 kgs.
Barcelona, 100
Boston, 50
Hamburg, 165
Havana, 25
Montreal, 56 brls.
Rotterdam, 4

Soda Ash—
Boston, 28 tcs. 391 cks. 200 bgs.
Hong Kong, 10 brls.
New York, 310 tcs.
Rio de Janeiro, 50
Santos, 5
Vera Cruz, 50
Baltimore, 632 cks. 80 tcs.
Barcelona, 70 brls.
Boston, 241
Maceio, 15
New Orleans, 39
Odessa, 100
Philadelphia, 370
Rio de Janeiro, 130
Smyrna, 85
Syra, 105
Tarragona, 42
Chicago, 104
Corfu, 100

Sodium Silicate—
Lisbon, 16 cks.
Messina, 175 brls.
Montreal, 45
Oporto, 12
Salonica, 30
Savanilla, 10
Venice, 32
Volo, 3
Mauritius, 10

Sodium Carbonate—
Montreal, 56 brls.
Rotterdam, 50

Saltpetre—

Natal,	1 t.	1 c.	1 q.	£24
Maceio,	1	1	1	24
Tampico,	1	7	2	30
Piræus,	7	10		158
St. John,	1			22

Sheep Dip—

Calcutta,	1 t.	10 c.		£38
Algoa Bay,	13	16		602
Natal,		19		40

Sodium Biborate—

Hamburg,	12 t.			£366
Antwerp,	5	7 c.	1 q.	161
Montreal,	2	13		80
Hong Kong,	5	19		179
Stockholm,	10	10	1	315
Antwerp,	5	4	2	157
Hamburg,	5	4		156
Rotterdam,	5	3	1	153

Sodium Phosphate—

Lisbon,		6 c.	1 q.	£6

Saltcake—

Baltimore,	162 t.	18 c.		£387

Sodium Sulphate—

Leghorn,	2 t.	8 c.	1 q.	£13

Sodium Chlorate—

New York,	2 t.	10 c.		£151
Hamburg,	1			55

Sulphur—

Montreal,	17 t.	11 c.	2 q.	£84
Boston,	120	1		510
Havana,		13		6
Boston,	50	1		216
Ceara,	1			7
Boston,	50	2		225
St. John,	2	5		16
Boston,	25	1		210
Rouen,	31			150
Boston,	50			225

Salammoniac—

Kurrachee,	1 t.	12 c.		£52
,,	1	1		37
Galatz,		5	2 q.	10
Montreal,	1	1		38
Bombay,	2	11		89
Marseilles,		5		8
Patras,		6	2	11
Rosario,		4	1	7

Sugar of Lead—

Bombay,	5 c.		£6
Santos,	11		13

Sulphuric Acid—

Coquimbo,	9 gls.			£8
Pernambuco,	20			6
Monte Video,	1 t.	10 c.		18
Santos,	24	4		21

Sodium Nitrate—

New York,	1 t.	6 c.		£40
Barcelona,	12	12	2 q.	107
Lisbon,	51		1	432
Syra,		15	1	7

Tar—
Sherbro, 10 brls.

Zinc Chloride—

Bombay,	1 t.	2 c.	£18

GLASGOW.

Week ending September 11th.

Albumen—

Lisbon,				£66

Ammonium Sulphate—

Demerara,	37 t.	17 c.		£411

Alum—

Penang,	5 t.			£26

Borax—

Rouen,	206 c.			£150

Copper Sulphate—

Rouen,	406 c.			£479

Caustic Soda—

Sydney,	406 c.			£235

Dyestuffs—
Extracts

Quebec,	23 c.			£35
,,				84

Tumeric

Quebec,	42 c.			£31

Cutch

St. John's, Nfld.,	1 t.	1 c.		£23

Dyestuffs *(otherwise undescribed)*

Lisbon,	51 c.			£24

Glucose—

Cape Colony,	6 t.	12¼ c.		£93

Litharge—

Montreal,	2 t.	4½ c.		£36

Manure—

Mauritius,	158 t.	14 c.		£1,895
Batavia,	1,034	17¼		9,287
Demerara,	13			120
,,	12			90

Naphtha—

Rouen,				£300

Potassium Bichromate—

Japan,	5 t.			£163
Antwerp,	5	15¼ c.		180
Rouen,	14	2¾		433
Amsterdam,	12 cks.			164
Calcutta,		5¼		
Rouen,	39	18		1,273

Potassium Prussiate—

Christiania,	1 ck.			£13
Rouen,	6 t.	¾ c.		377

Paraffin Wax—

Antwerp,	5 t.	2½ c.		£150
Rouen,		26¾		39
Lisbon,	2,355 lbs.			£30
Bombay,	2,400			39. 10s.

Pitch—

Halifax,	28 t.	16 s.		£60
Quebec,	42½			65

Sugar of Lead—

Calcutta,		20½ c.		£39

Sulphur—

Demerara,	15 t.	1½ c.		£80

Soda—

Demerara,	3 t.	9½ c.		£34. 15s.

Salt—

Demerara,	17 t.	17 c.		£32. 10s.

Sodium Bichromate—

Rouen,	28 t.	27¼ c.		£737
Antwerp,	2	6¾		60
Rouen,	4	14		98

Sulphuric Acid—

Colombo,	9 t.	16 c.		£44
Madras,	17	19½		97

Superphosphate—

Stettin,	320 t.	3 c.		£1,531
Christiania,	25			70

Tar—

St. John's, Nfld.,	40 ¼-brls.			£14
Penang,	47 t.	6½ c.		100
Madras,				77

TYNE.

Week ending September 10th.

Ammonium Sulphate—

Antwerp,	20 t.			
Odense,	5			

Antimony Star—
Barcelona, 12

Alkali—

Copenhagen,			10 c.	
Gothenburg,	3 t.	9		
Carthagena,	10	14		
Antwerp,	15	18		
Rotterdam,	1	11		
,,	1			

Alum—
Rotterdam, 10 t. 11 c.

Anthracene—
Rotterdam, 20 t. 6 c.

Barytes Carbonate—
Stettin, 250 t.

Bleaching Powder—

Copenhagen,	25 t.	12 c.	
Barcelona,	5	10	
Gothenburg,	10	2	
,,	20	2	
Hamburg,	73	10	
,,	33	18	
,,	11	14	
,,	45	14	
St. Petersburg,	124	3	
,,	203	15	
Antwerp,	110	11	
San Francisco,	93	6	
Odense,	3	6	
Stettin,	150	13	
,,	2	9	
Gothenburg,	4	5	
Rotterdam,	2	9	
,,	26	12	
,,	11	5	

Barium Chloride—
St Petersburg, 2 t. 2 c.

Basic Phosphate—
Aarhuus, 15 t.

Caustic Soda—

St. Petersburg,	50 t.	4 c.	
Antwerp,	3	3	
Copenhagen,	2	4	
Barcelona,	6	18	
,,	61	2	
Gothenburg,	60	7	
San Francisco,	1	1	
Stettin,	2	18	

Copperas—
San Francisco, 51 t.

Gutta Percha—
Christiania, 137 lbs.

Litharge—

Hamburg,	1 t.	7 c.	
St Petersburg,	5	7	
Antwerp,	1	5	

Manganese—

Bilbao,	50 t.	18 c.	

Magnesia—

Barcelona,	12 t.		
Rotterdam,		2 c.	

Potassium Chlorate—

Rotterdam,	3 t.	6 c.	

Potassium Bichromate—

Rotterdam,	1 t.	2 c.	

Sodium Manganate—

Hamburg,	3 t.	9 c.	

Sodium—
Hamburg, 1 cs.

Soda—

Esbjerg,	6 t.	9 c.	
Christiania,		10	
Frederikshavn,	9	11	
Odense,	20	1	
Rotterdam,	10	15	

Superphosphate—

Esbjerg,	29 t.	9 c.	
Copenhagen,	5	17	
Frederikshavn,	594	3	
Randers,	51	7	
Aarhuus,		5	

Soda Ash—

Libau,	10 t.		
Antwerp,	2	1 c.	
Gothenburg,	2	8	
Nice,	6	9	

Sodium Silicate—

Barcelona,	17 t.	2 c.	

Sulphur—

Gothenburg,	27 t.	10 c.	
,,	20		

Tar—

Christiania,	5 cks.		
Hamburg,	2		

HULL.

Week ending Sept. 9th.

Alkali—

Riga,	36 cks.		
Venice,	30		

Alum—
Wasa, 2 cks.

Bleaching Powder—

Abo,	1 ck.		
Bergen,	18		
Libau,	1 cs.		
Rotterdam,	14		
Venice,	34		

Borax—
Christiania, 2 cs.

Benzole—
Hamburg, 15 drms.

Bone Size—
Harlingen, 11 cks.

Caustic Soda—

Antwerp,	18 drms.		
Gothenburg,	18		
Harlingen,	19		
Helsingfors,	201	1 ck.	
Konigsberg,	33		
Libau,	191		
Riga,	209	3	

Chemicals *(otherwise undescribed)*

Antwerp,	26 pks.		
Bergen,	15		
Copenhagen,	10	18 cks.	
Christiania,	25	11 cs.	317 slbs.
Christiansund,			316
Dunkirk,			27 cks.
Fiume,	100		12
Gothenburg,	12	25 cs.	
Hamburg,	8	355	82
Libau,		17	
Palermo,		2	
Rouen,			41
Rotterdam,	30	30	36
Riga,	504	5	72
St. Petersburg,		40	1 cs.
Stettin,		8	
Trieste,		35	

Dyestuffs *(otherwise undescribed)*

Antwerp,	3 kgs.	6 cks.	
Hamburg,	1 cs.	3	3 drms.
Rouen,	1	1	
Rotterdam,	4	5	
Riga,	1		
Reval,		74	
Stettin,	4	32	90 bls.

Manure—

Copenhagen,		118 bgs.	
Esberg,	385 t.		
Hamburg,		400	
Libau,		5,091	
Stettin,		1,172	

Pitch—
Antwerp, 118 t.

GOOLE.

Week ending Sept. 3rd.

Bleaching Powder—
Rotterdam, 15 cks.

Benzole—

Calais,	55 cks.	
Rotterdam,	49	

Coal Products—
Rotterdam, 235 cks.

Chemicals *(otherwise undescribed)*
Hamburg, 5 cks.

Dyestuffs *(otherwise undescribed)*

Boulogne,	4 cs.	3 cks.	5 drms.
Hamburg,		126	
Rotterdam,		1	
Ghent,		1	1
Rouen,			1

Manure—
Boulogne, 90 bgs.

Pitch—
Antwerp, 60 t.

GRIMSBY.

Week ending Sept. 6th.

Ammonium Sulphate—
Rotterdam, 30 t.

Chemicals *(otherwise undescribed)*
Dieppe, 80 pks.
Hamburg, 10

PRICES CURRENT. WEDNESDAY, SEPTEMBER 17, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	62/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	1	0
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. . . per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. per ton	11	13	9
,, ,, (grey), Hull .. .. ,,	11	10	0
Aniline Oil (pure) .. .. per lb.	0	0	11½
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. . . ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	10	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	11	10	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. per gallon	0	4	1½
,, 50/90 ,, ... ,,	0	3	1½
Carbolic Acid (crystallised 35°) .. .. per lb.	0	0	7
,, (crude 60°) .. .. per gallon	0	1	9
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. per gallon	0	1	10
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	61	7	6
,, Sulphate .. .. ,,	19	10	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	0	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	2	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. ,,	0	4	4½
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	26	0	0
Lubricating, Scotch, 890°—895° .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9¾
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	5½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	5	17	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	12	15	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	5	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	5	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	2	6
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	10	0
,, Bicarbonate .. .. ,,	5	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	1	12	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,	0	0	5¾
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	28	0	0
Tin (English Ingots) .. .. ,,	102	0	0
,, Crystals .. .. per lb.	0	0	6½
Zinc (Spelter) .. .. per ton.	24	17	6
,, Chloride (solution, 96° Tw. .. .. ,,	6	5	0

THE

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TECHNICAL EDUCATION.

AUTUMN has come, and the youth of the country is girding up its loins for the struggle in the coming winter. Already the "shouting of the captains" is to be heard, and programmes of the various instructors, good, bad, or indifferent are to be seen, inviting all who are interested to come and partake of the goodly feast of reason and flow of knowledge to be found within the gates of their respective academies. Among others, the voices of those are heard who invite the student to attend their particular courses of technical instruction in this, that, or the other branch of industry, including, we need not say, the subject of Technical Chemistry. We are not without some experience, both as regards those who teach Technical Chemistry, and those who have been their pupils, with the result that we are disposed to take a view of the subject which compared with some of the recent radiations of shining scientific lights will, perhaps, be deemed heretical. The student of science, whether he knows it or not, should be actuated by a definite purpose, and it is necessary here to point out that the definite purpose should be sufficiently limited in its scope to give the student a reasonable chance of its successful accomplishment. A student may become possessed with the definite purpose of acquiring a technical knowledge of nearly every chemical industry existent, and we must say that one or two of the prospectuses we have seen would tempt the youthful enthusiast to do this with the result that his little knowledge becomes a dangerous thing to himself and his future employers.

If, therefore, a student requires to know technical chemistry in its relation to Tar Distilling, or Dyeing and Calico Printing, it seems to us that it is unwise for him to devote his attention simultaneously to the acquisition of the chemical details of the manufacture of Sulphuric Acid, or Oil, Tallow, and Grease Refining, or Chemical Manures. This then brings forward the question, are the courses of instruction usually given in technical schools or colleges properly framed to ensure this end. Without professing to know all the different methods, we would say that those systems are wrong in which a whole body of students, having various and diverse definite purposes in view are grouped together in a lecture theatre, and submitted to a series of discourses consisting largely of formulæ and elementary principles, which are usually and rightly to be found in courses of instruction in chemistry, pure, simple, and non-technical. We believe that for a person contemplating the study of dyeing and calico printing, for instance, the best thing is to at once recognise that there is no royal road; that he cannot acquire the desired knowledge all at once; that he should sufficiently master the principles of inorganic and organic chemistry, to pass—let us say—the advanced stage of the Science and Art Department, and then devote his attention to the particular branch in question, with singleness of purpose and under a competent instructor. A saying is attributed to P. T. Barnum, that "if you keep on hammering at one nail, you are pretty sure to get it home at last;" the truth of which is too obvious to be gainsaid.

We fancy we hear some one echoing the words "competent instructor," and certainly the choice of an instructor in chemical technology is not too easy a task. There are not wanting those who set up as instructors, though they have scarcely done more than pay an odd visit to a gas works, or made a carefully guided tour of an alkali works in the company of a keen witted manager at a time when they were expected. The colleges of this country are not well supplied with men, who, in addition to being highly qualified chemists, have spent years in the successful daily practice of technological chemistry. Yet this is the sort of man the instructor should be. Placed in the care of such a teacher, in a well-appointed laboratory, there should be no difficulty to prevent any student, who has mastered the preliminaries above referred to, from acquiring a very creditable and useful knowledge of the particular branch to which he devotes his energies.

THE MANCHESTER TECHNICAL SCHOOL.

OPENING OF THE CHEMICAL CLASSES.

THE Chemistry, Dyeing, and Printing Department of the Manchester Technical School was opened on Friday evening, the 19th inst., with an address by Mr. Ivan Levinstein, chairman of the Manchester secton of the Society of Chemical Industry. Mr. H. WORRALL presided, and amongst others present were, Mr. F. Godlee, Mr. H. Renold, Mr. T. G. Lomas, Mr. R. F. Carpenter, Mr. George E. Davis, Mr. J. Murgatroyd, Mr. S. B. Worthington, Mr. E. L. Rhead, Mr. J. Grant, Mr. E. E. Milnes, and Mr. Reynolds (the secretary).

The CHAIRMAN said the classes which they had met to open for the season embraced a most extensive and varied field. The number of entries in these classes had never, so far, been very large, but the results in the way of honours secured had been very satisfactory. This year there were so far 45 entries of evening students for the dyeing and bleaching, and eight day students, and he hoped that the coming session would be attended with greater success than any of its predecessors.

Mr. LEVINSTEIN, in his address, expressed regret that one of his first duties should be to inform them that, during the year, this department of the school had lost two of its teachers, viz. Dr. Dyson and Mr. Bentz, whose resignations had caused considerable anxiety to the managers of the school. The managers had filled the vacancies by the appointment of two men, both eminent in their respective spheres of knowledge, viz. Dr. Knecht, of the Bradford Technical College whom he begged to introduce to them as head master of the chemical and tinctorial department, and Dr. Liebmann, of the university of Bonn, who would be the evening lecturer. He felt satisfied that the teaching staff was a thoroughly capable one, but however great might be the ability of the teachers, it was absolutely necessary, if their efforts were not, to some extent, to be rendered useless, that other considerations should be kept in view. There should be (1) proper and sound preparation of the student in general knowledge before entering on the study of a special scientific and technical subject (2), a sufficient length of time should be devoted to the study of the special subjects selected, and (3) it should be seen that the school intended for teaching these special subjects was satisfactorily equipped. Even with attention to these considerations, neither that school nor any other similar institution ought to be expected to turn out experienced dyers or printers or technical chemists. Experience, in fact, could only be acquired in the workshop. All the same, we did well to inquire into the real advantages of technical instruction, and into the legitimate purposes and aim of technical schools. He took it that the true and real object of a technical school was to prepare the student, say, for the dye, print, colour, chemical, or kindred works in such a manner that on entering them he would be familiar with all the respective manipulations, appliances, apparatus, and plant which he might meet there, and, more than this, that he would be acquainted with the use of all the ingredients and chemicals, with their composition and combination, with the analytical and synthetical methods for determining their composition or, as the case might be, for producing similar results, and finally that his mind should have been practised and trained in independent research, so as to be able to strike out into new paths of knowledge. With such instruction and information a student with ordinary aptitude would be able to make himself far more valuable as a dyer or printer or works chemist within a comparatively short time than if he had not had the advantage of a preparatory scientific and technical training. Such a student would ultimately not only benefit himself by the higher remuneration which his superior knowledge gave him the right to demand, but he would materially assist in developing our trades and industries and in fortifying our position against increasing foreign competition. This was, in his opinion, the true and inestimable value of technical instruction. We in this country were now becoming more and more alive to the need of technical education, and the means of securing it were in no small measure due to the efforts of two Manchester men. He could not believe, however, that they who were so deeply interested in this subject would rest satisfied with the fact of the increase in the number of technical schools and their prospective multiplication. As far as regards higher technical instruction at least, including such subjects as chemical technology, dyeing and printing, it never was a question of quantity, but solely of improved quality; and as for technical instruction in its general sense, he could not even here see any gain in the mere increase and extension without fixed plan of the number of technical schools. The schools so far established, and apparently also those which were going to be founded, all went in for a scheme as ambiguous and comprehensive as could well be imagined; all took the same subjects and adopted similar grades of education. If this planless system in the establishment of technical schools was going to be continued, and no principle established by which such schools, or at the very least those which were founded in the same county, might co-operate and co-ordinate themselves to each other in reference to the grade of education and to the selection of subjects to be taught, he apprehended that the result would be a very considerable expenditure of money without an adequate equivalent. For example, we had already within a radius of eight miles of Manchester many schools which included chemical technology, dyeing, printing, &c., in their curriculum, and before long Salford and Rochdale, and probably half a dozen other towns in Lancashire would follow the lead of those schools. Now to teach such subjects successfully a very high class of teachers and first-rate appliances were required, both of which were very expensive. Where, then, was the money to come from to furnish these schools with these absolutely necessary requirements, and to maintain them at a high degree of efficiency? But even putttng the important question of money on one side, where would they find at present the requisite number of teachers really competent to teach these subjects in such a manner as they ought to be taught? They could almost count on their fingers the number of teachers available in Europe who were competent already to undertake this work. But if we should be able, satisfactorily, to solve this problem, where would we get the students to take advantage of the facilities offered to them? And if he was mistaken in all his propositions, where would we find employment for all these students when they had completed their course of instruction? There was absolutely neither room nor need, in his opinion, for such a number of schools, within such a comparatively small area, for teaching tinctorial chemistry and the arts of dyeing, printing, and bleaching, and he felt quite certain that if a number of second-rate schools were established, taking up the teaching of these subjects in a manner which under the circumstances would be necessarily second-rate, we would be sadly disappointed with the results. The money available for technical instruction would be dribbled away for the sole purpose of turning out annually so many hundreds or thousands of young men who would have learned a little bit of everything, but thoroughly and practically nothing. It could not possibly serve any good purpose that promoters and managers of technical schools should follow the unfortunate plan of comprising within their scheme of teaching almost as many technical and scientific subjects as one could find names for in a comprehensive dictionary. Instruction of the very best kind in a few leading subjects bearing specially on the industries largely represented in the locality in which the school was established, would be a thousand times more useful and valuable than the cramming of multifarious subjects into the heads of students, probably for the sole purpose of catching the public favour and getting grants from the Science and Art Department, or other available sources. What he pleaded for was the division of labour, graduation of the system of teaching and the subjects taught, and avoiding unnecesssary overlapping, which could only be carried out by co-operation and concert between these various schools, and which he was afraid would not be carried out unless some authority used its influence to enforce it. There was still plenty of room and scope for intermediate or preparatory schools taking up the teaching of art and science without specialising any technical subject, and there was further room for schools organised for teaching thoroughly a few technical subjects, the selection of which must be regulated by the importance of the industry peculiar to the locality it which it was established. The establishment of a more comprehensive technical school embracing higher technical education, was, in his opinion, only justified in important centres of industry in which a large number of various branches of industry were established. He sincerely hoped that the Manchester Whitworth Institute would establish in Manchester a school that would take the position of a central technical institution in which

the highest grade of technical instruction might be obtained, and the mental faculties of those students fully developed who had proved and shown in the preparatory science schools their aptitude and ability for a higher education in technical subjects, and in which teachers might be trained for other schools under the direction of men of eminent and recognised talent and ability. It was to be hoped that in this institution special attention might be paid to engineering, chemical and electrical industries, to spinning, weaving, and designing, tinctorial chemistry, dyeing, printing, finishing, bleaching, papermaking, and to the teaching of the scientific principles underlying these arts; and that the school to be built might be thoroughly adapted for the purpose, and be furnished with the most perfect appliances on a level with the latest progress in these various arts and manufactures—a school, in fact, superior to any in this country or elsewhere, by means of which the students would on leaving be fully equipped with all the preparatory knowledge required for eventually accupying a leading position in his trade or profession. In a school so equipped abundant provision would be made for intelligent and well-prepared evening students who, engaged in their daily occupations and having in view their professional and trade advancement, were desirous of further supplementing their knowledge and experience by carefully following courses of evening lectures and laboratory practice in the principles and processes of chemical technology, bleaching, dyeing, printing, etc. Manchester, with the munificent generosity of the late Sir Joseph Whitworth, with support from the local rates, and probable important help from other funds available for technical instruction, with its exceptionally large and liberal population, could successfully carry out such a scheme. Manchester, the largest manufacturing centre, required such an institution more than any other town in the world. The amount necessary for the erection, equipment, and maintenance of such an institution would be large, he granted; but let us show to our generous population, to our manufacturers, merchants, and working classes that we intended to establish a school worthy of our city, beneficial to our trades and commerce, and the money, from which our community would reap manifold returns long before this generation had passed away, would be forthcoming.

At the close of his address, Mr. LEVINSTEIN said:—I remember the difficulties which I encountered when charged with the organisation of a Chemical Section in our Jubilee Exhibition, in getting space allotted in the Exhibition building suitable and sufficient for the proper display of the exhibits. Some gentlemen of the council could not appreciate the possibility of making an exhibition of chemicals in any way interesting to the public, and my section was known by the nickname of smelling—or something worse—or the bottle section, even up to the day of the opening of the exhibition. Specially loud in their demonstrations were those gentlemen who claimed to possess artistic inclinations—to them the very sound of the word "chemical" appeared to be the embodiment of ugliness of shape and form, their noses were offended by horrid smells, and their visions darkened by awful vapours, poisoning their very breath.

Now, gentlemen, I think even the greatest artist need not look upon the chemist with any kind of contempt or pity—both really work in a similar direction, and their fields of labour are not unlike. The painter, for example, takes as his ideal the imitation of all that is beautiful in nature, and the nearer he can approach reality, the more highly will his art be appreciated. The chemist is only distinguished from the painter by carrying his ideal a step higher; he endeavours not only to discover the hidden treasures and secrets of nature, but to reproduce matter identical in shape, form, and constitution; and whilst the greatest painter has never succeeded in presenting a perfectly accurate reproduction of nature's wonderful works, the chemist has absolutely synthetically built up and reproduced them.

Twenty-two years have passed since the scientific world was surprised by the startling discovery, that chemists had at last found the secret, hitherto preserved and kept by nature, of producing by human skill "Alizarine," and before many years had passed away, the artificial alizarine had entirely replaced the natural product.

Twelve years later, another great achievement was announced, viz., the artificial production of Indigo, and thus human hands were able to produce, in practically unlimited quantities, two of the most important dye materials, which hitherto had been solely accessible to mankind through the chemistry of nature.

Fortunately, however, for a portion of our colonial trade, the processes for the production of artificial indigo were all so complicated and costly, that its introduction into practical use has hitherto been very limited indeed. Quite recently, however, an entirely new method has been discovered, which is at once so simple and easy to execute, that I cannot help thinking that it may lead to the result so dreaded by our Indian friends, who are interested in this product.

Considering that Manchester is perhaps the largest consumer of indigo, and that the practical perfection of the process of manufacture of the artificial product would have a marked influence on the export of our colonies, I thought that it might not be uninteresting to you to make yourselves acquainted with this the latest discovery in the field of chemical technology.

Mr. Levinstein here showed a very interesting experiment, demonstrating the production of indigo-white, and its subsequent oxidation to indigo-blue when exposed to the atmosphere, which he described in the following terms:—

Long before the first attempt was successfully made at producing artificial indigo, there was known to chemists a compound which was called Phenylglycocine—a substance which can be easily obtained by the action of aniline on monochloracetic acid. No technical use, however, had been found for this compound, until at last Professor Heumann, of the Polytechnic School in Zurich, was fortunate enough to discover that this apparently useless substance could easily be converted into indigo by simply heating it with caustic potash or caustic soda—a discovery which is as simple as it is beautiful. Monochloracetic acid is produced by treating glacial acetic acid with chlorine. The ingredients, therefore, necessary for this new mode of manufacturing indigo are, acetic acid, chlorine, caustic alkali, and aniline—ingredients all readily obtainable in the market. It is also interesting to observe, that whilst aniline was first obtained in the year 1826 from indigo, aniline appears to be destined to become the primary and principal material for obtaining indigo.

THE SEPARATION OF TIN AND ANTIMONY.*

By HENRY N. WARREN.

A CONVENIENT quantity of the sample, either an ore or slag, as the case may admit of, having been reduced to a powder by the usual method, is introduced into a nickel crucible of convenient dimensions and intimately mixed with about ten times its weight of a mixture of sodium carbonate and one of borax, the decomposition being brought about by the application for a few minutes of a full red heat from an ordinary foot blow pipe, when all necessary reaction has terminated, the contents may be advantageously poured on to the surface of an iron slab, or other incombustible substance. The melt thus obtained is readily and completely discoloured by the aid of a small quantity of dilute H Cl, introduced into a flask of known capacity, together with the small quantity which still adheres to the sides of the crucible which is readily detached by pouring into the same a further quantity of dilute acid and gently warming. The contents of the flask are now diluted to the containing mark, and a known quantity withdrawn by the aid of a pipette, which is received into an accompanying flask, and saturated with a stream of SH_2 gas. Tin, antimony, and similar metals of the same group, becoming consequently precipitated as sulphides, the mixed precipitates thus obtained are filtered and collected by means of a plug of cotton inserted in the neck of a glass funnel, the cotton with its contents after being once washed is dislodged and received into a vessel containing a strong solution of NaHO, the same being raised and maintained for a few minutes at the boiling point, the tin and antimony sulphide passing into solution as sulphostannate and sulphoantimoniate of soda.

The soluble tin and antimony compounds thus obtained are separated by refiltering as in the previous filtration. and divided into two separate portions, being received for convenience sake into two flasks, and labelled A and B portions; to the A portion is introduced a somewhat large excess of oxalic acid, and the solution allowed to boil until the small quantity of antimony sulphide that remains presents a pure orange red precipitate, characteristic of that compound: the precipitate being collected in the usual manner and decomposed in a porcelain crucible at a very low red heat, weighing as Sb_2O_4 and calculating to percentage of antimony.

To the second, or B portion, is added an excess of dilute H Cl, and the whole gently warmed, the reprecipitated sulphide thus obtained treated precisely the same as in the previous instance, weighing the same as oxides, the total percentage of tin being obtained by deducting the former weight of precipitated oxide obtained from the A portion, from that of the mixed oxides obtainable from the second or B portion, and calculating by its respective formula.

The speed and accuracy obtainable by the method foreshadowed, largely depends upon the judicious use of the borax employed towards the commencement of the operation, whereby not only a most readily fusible compound is obtained, but at the same time being readily soluble in acid, insomuch that the author has not infrequently effected a complete assay of from twenty to thirty samples in a day, whereas by any of the methods hitherto employed one-tenth of that quantity are attended by considerable labour accompanied by more or less inaccuracy.

*The Chemical Trade Journal, Prize Essay.

COMPARATIVE INVESTIGATION OF BONE FATS.

BY A. A. TROICKY.

A NUMBER of bone fats obtained from various sources have been investigated, with the following results:—

Sample	Water %	Ash %	Fatty Acids %	Saponification equivalent.	Iodine absorption.	Solidifyg tmp. of fatty acids	Olein %	Stearin %
1. Extracted by boiling, superior appearance	1·20	0·31	93·20	187·0	57·2	39·0	59·18	34·02
2. Extracted by boiling	0·47	0·94	94.40	194·3	56·0	40·2	58·69	35·71
3. Extracted by petroleum	0·58	0·56	94·12	193·8	52·0	40·9	54·34	39·78
4. From Steppe bones	0·84	2.40	86·10	172·0	50·3	42.65	48·08	38·02
5. do. by petroleum	0·78	1·25	91·30	188·7	51·5	40·75	52·20	39·10
6. Petroleum from Warsaw.....	0·85	1·76	91·00	181·0	54·8	40·0	55·36	35·64
7. Petroleum from Ohlan	1·82	1·52	92·40	185·6	55·8	40·1	57·24	35·16
8. Petroleum from Moscow.....	0·91	1.06	92·85	187·0	55·2	40·9	56·90	35·95
9. Boiled from horse bones	1·52	1·82	91·50	184·0	62·7	36·1	63·69	27·87

Fats 2 and 3 were from table bones collected in St. Petersburg; 4 and 5 from Steppe bones, kept for a long time and partially weathered; 6 by the modified Seltsam's process; 7 and 8 by superheated heavy petroleum.

As the table shows, the boiled-out fat often contains a considerable amount of water (1, 4 and 9), but by adopting proper precautions the amount of water present may be reduced to a minimum (2). The fats extracted by petroleum generally contain but little water; but if the extraction be carelessly performed they may contain more water than the natural fat. Extracted fat has also less ash than the natural article, although this factor depends chiefly on the nature of the bones, and is very small when good raw material is employed (1).

The remaining properties given in the table are of special importance for the application of bone fat to the candle and soap industries. The saponification equivalent does not differ much in the various samples, with the exception of those which, on account of their high percentage of water and ash, must be regarded as impure and of low value. As regards the iodine absorption, it appears that the fats extracted by light petroleum (1 and 3) contain more solid fatty acids than those got from the same material by boiling (2 and 4); moreover the fat extracted by light petroleum is also better than that got by superheated heavy petroleum (6, 7 and 8). The latter also possesses a darker colour and unpleasant smell, which is due to petroleum left in the fat and to decomposed albuminous matter. These numbers also show that the percentage of olein is greater when heavy petroleum is used; this renders the fat less adapted for the stearin industry. These disadvantages are in great measure due to the faulty method of extraction with petroleum. In cases 6, 7 and 8, the operation is either carried out at a high pressure or continued for a long time (up to eighteen hours) at 100°; the water contained in the bones (ab :u 20%) is thus converted into steam, and causes the evolution of ammonia from the albuminous matter present. This again acts upon the fat, and in this way decompositions take place, which render the fat of a very poor quality.—*Chemiker Zeitung.*

BLEACHING OIL.

ABOUT 10 kilos. of good bleaching powder are dissolved in 100 litres of cold water. Twenty litres of the clear liquid are then mixed with 100 kilos. of dark coloured heavy petroleum of sp. gr. 0·905 at 20°, or with tar oils, and the mixture thoroughly stirred up and allowed to settle. The oil, which is still somewhat turbid, is drawn off and mixed with the heaviest distilled resin oil in the proportion of 25·30 parts to 50·75 parts of the latter. Fabrics treated with this mixture are said to require much less time and treatment for bleaching than otherwise. German Patent, 52,505, November 19, 1889. Heinrich Ermisch, Magdelburg.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

JOSEPH AIRD, GREATBRIDGE.—Iron tubes and coils of all kinds.

ASHMORE, BENSON, PEASE AND CO., STOCKTON-ON-TEES.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

BLACKMAN VENTILATING CO., LONDON.—Fans, Air Propellers, Ventilating Machinery.

GEO. G. BLACKWELL, LIVERPOOL.—Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

BRUNNER, MOND AND CO., NORTHWICH.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

BUCKLEY BRICK AND TILE CO., BUCKLEY.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

CHADDERTON IRON WORKS CO., CHADDERTON.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. CLAY, EDINBURGH.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

CLAYTON ANILINE CO., CLAYTON.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. CORTIN, NEWCASTLE-ON-TYNE.—Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. DAGLISH AND CO., ST. HELENS.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

DAVIS BROS., MANCHESTER.—Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. DEMPSTER, MANCHESTER.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

DOULTON AND CO., LAMBETH.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. FAHRIG, PLAISTOW, ESSEX.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

GALLOWAYS, LIMITED, MANCHESTER.—Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

JOHN A. GILBERT AND CO. LTD., LONDON.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

GRIMSHAW BROS., LIMITED, CLAYTON.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

JEWSBURY AND BROWN, MANCHESTER.—Samples of Aerated Waters

JOSEPH KERSHAW AND CO., HOLLINWOOD.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. LINDSEY AND CO., CLAYTON.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

CHAS. LOWE AND CO., REDDISH.—Mural Tablet-makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

MANCHESTER ANILINE CO., MANCHESTER.—Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

MELDRUM BROS., MANCHESTER.—Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. MILNES AND BROTHER, BURY.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

MUSGRAVE AND CO., BELFAST.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

NEWCASTLE CHEMICAL WORKS COMPANY, LIMITED, NEWCASTLE-ON-TYNE.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

ROBINSON, COOKS, AND COMPANY, ST. HELENS.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. ROYLE, MANCHESTER.—Steam Reducing Valves.

A. SMITH, CLAYTON.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

WORTHINGTON PUMPING ENGINE COMPANY, LONDON.—Pumping Machinery. Speciality, their "Duplex" Pump.

JOSEPH WRIGHT AND COMPANY, TIPTON.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

ON THE UNBURNED GASES CONTAINED IN THE FLUE GASES FROM GAS STOVES AND DIFFERENT BURNERS.

By William Thomson, F.R.S.E., F.C.S.

Read before Section B at the Leeds meeting of the British Association.

I HAVE been working for some time with a view of determining whether the gases escaping as flue gases from gas stoves and different burners were really free from gas capable of combustion, such as carbon Monoxide, or unburnt hydrocarbons, or hydrogen. I spent some time in trying to separate and determine the quantity of carbon monoxide present if any but this problem was beset with so many difficulties, that for the moment I abandoned it and contented myself for the present with determining the quantity of unburned carbon and hydrogen in whatever forms these might exist.

For this purpose I arranged an apparatus consisting of two carefully weighed U tubes, filled with strong sulphuric acid, and two weighed U tubes filled with soda lime, through which the flue gases were first passed, these absorbed the water and carbon dioxide contained in the flue gases, leaving the hydro carbons (not absorbed by vitriol) hydrogen and carbon monoxide to pass through a red hot glass tube filled closely to the extent of 15 inches with oxide of copper prepared *in situ* from copper wire gauze. The gases were then passed through strong sulphuric acid and soda lime contained in previously weighed U tubes and the results were calculated on the gas measured at 60° Fahrenheit and 30 inches barometric pressure, from the measure of gas drawn into the aspirator (treated as water saturated gas) the carbon dioxide and water vapor absorbed in the tubes were then added on to making up the measure of flue gas originally employed, and which was taken for the determinations.

The coal gas employed was previously passed through large cylinders filled with calcium chloride to dry it before combustion, and at the same time as the experiment was going on and side by side with it was estimated the carbon dioxide and water vapour present in the air itself by passing it by means of another aspirator through strong sulphuric acid and soda lime in U tubes previously weighed.

The carbon dioxide in the air itself ranged from 0·41 to 0·66 grains per cubic foot of air and *the water* from 3·51 to 7·23 grains in the same volume.

The amounts of carbon dioxide and water collected from the flue gases, after deducting the quantities actually present in the air, were taken as those due to the combustion of the coal gas. The standard I employed was the one used by Professor Roberts Austin in his analysis of the flue gases from the burning of coal, and the apparatus employed was generally similar to that also employed by him.

The carbon and hydrogen left unburned were measured in terms of 1000 parts of carbon actually derived from the combustion of the gas in the stove or burner.

The total quantities of carbon dioxide and of water in the flue gases amounted to from 6·6 to 10·8 grains per cubic foot for the former and from 5·6 to 10·5 grains of the latter, in the same volume.

The amount of flue gas passed in each experiment was about one cubic foot, and although the variations were considerable. the general results were conclusive in shewing that the combustion of gas when burned in gas stoves for heating purposes is much more incomplete than one might be led to suppose.

The only burner in which the weight of the tubes remained constant after passing the burned gas, and in which the combustion was presumably complete was in a paraffin oil lamp in which the flame was not turned to its highest point. In another experiment with the flame turned full on 12·04 and 3·09 respectively of carbon and hydrogen escaped combustion per 1,000 of carbon completely burned.

The next nearest approach to complete combustion was in an Argand burner, in all which the carbon was completely burned, but an amount representing 0·2575 parts of hydrogen escaped combustion per 1,000 parts of carbon completely burned, whilst in a second experiment 0·113 of carbon, 2·5414 of hydrogen escaping combustion were registered per 1,000 parts of carbon completely burned.

Then came one of Bray's ordinary flat flame burners, burning 4 cubic feet per hour, which gave 11·12 of carbon and 0·95 of hydrogen unburned per 1.000 of carbon completely burned.

Following in the order these results came, the Welsbach light, in which the gas heats to whiteness a tube or mantle composed of a filmy thickness of the oxides of Zirconium and Titanium, the mantle being surrounded by a glass tube similar to that used in some paraffin oil lamps, in this case the unburned carbon exceeded in amount the unburned hydrogen, there being 15·486 of the former and 3·794 of the latter per 1,000 of completely burned carbon. Three experiments were made with a *Marsh-Greenall's* heating stove, in which three Bray's luminous burners were employed.

The first was made with a consumption of 5·62 cubic feet of gas per hour, when 12·6 and 3·0 parts of carbon and hydrogen respectively were registered per 1,000 parts of carbon completely burned.

The second experiment with a consumption of 5·74 cubic feet per hour gave 37·6 and 11·8 respectively of carbon and hydrogen burned.

The third experiment with an increased consumption of gas (7·1 cubic feet per hour) gave 97·4 and 12·1 of carbon and hydrogen respectively unburned.

Two experiments were made with one of *T. Fletcher's heating stoves in which eight Bunsen burners play upon some fancy metal work* (Iron coated with magnetic oxide), the one *experiment* in which the amount of gas passing was not measured, gave 43·3 of carbon and 24·6 of hydrogen unburned per 1,000 of carbon completely burned.

In the *second experiment* where 6·81 cubic feet of gas were burned per hour, 66·3 and 20·0 respectively of carbon and hydrogen unburned were registered.

One experiment was made with one of *T. Fletcher's stoves* in which *20 Bunsen burners play on asbestos projecting from a fireclay back*, with a consumption of 8·14 cubic feet of gas, 138·9 and 11·7 parts respectively of carbon and hydrogen per 1,000 parts of completely burned carbon were found.

In a stove in which the hot gases rise to the top of a cylinder filled with pipes (through which cold air passes to be heated) and from the bottom of which the burned gases escaped after having cooled to a considerable extent, upwards of 200 parts of carbon escaped combustion per 1000 parts of carbon completely burned.

I have to thank my assistant Mr. Harry Bowes for the careful manner in which he has performed the delicate and difficult experiment from which the above results were obtained.

DETERMINATION OF TANNIN IN BARK, &c.

LOWENTHAL'S method has no sound theoretical basis, and, moreover, is not simple; three chemists working independantly of each other would most probably not obtain agreeing results by it, although, when carried out uniformly by a single chemist, constant results can finally be obtained. Precipitation with copper acetate gives good results when it is done in a hot solution, the precipitate filtered off immediately washed with hot water, dried at 110° and weighed. After weighing it is burnt, and ⅘ of the copper oxide found subtracted from the total weight of the precipitate. In this way the total tannins are determined, but in every bark extract, both tannins which precipitate gelatine and those which do not (gallic acid and other decomposition and hydration products) are present, while the value of the material depends chiefly on the proportion of the former class. To determine the amount of tannin which combines with gelatine, the Davy-Müller process may be used in the following manner:—

The extract is prepared by digesting 20 grms. of bark, once with 200, and 5 times with 160 cc. of hot water on the water bath for 15 minutes at a time, filtering and making up the filtrate to 1 litre. A solution of tannin containing one grm. in 500 cc. is also necessary as well as a gelatine solution of 10 grms. gelatine, 5 grms. alum, and 10 grms. of boric acid per litre, which keeps better when it is shaken up with 20 cc. of ether and a little chloroform.

One hundred cc. of the extract are taken as soon as possible after making it, 5 grms. of salt added, and the liquid heated gently on the water bath to about 40°. 50 cc. of the gelatine solution are then gradually added, the mixture being only slowly stirred. When the precipitate has settled, filter off at once, wash with water at 50·60° and dry at 110°. 100 cc. of the tannin solution are treated in precisely the same way. If the extract does not become clear after precipitation it may be allowed to stand for some time before being filtered, but in this case the tannin solution must be treated in exactly the same manner. After weighing, the percentage of tannin is calculated by the equation. Tn: Ex. :: 8.5 : x where 85 is the percentage of tannin) in the material used to make the standard solution (1 grm. to 500 cbc.) Tn is the weight of precipitate obtained from the standard tannin solution, and Ex. that of the precipitate from the bark extract. In medium oak bark 8-10% of tannin was found by this method. The error might amount to 5 per cent. of this value, *i.e.*, about 0·5% in this case. The most serious errror is made when the solutions are allowed to stand, perhaps, over night. I have then found that the amount of tannin found was only ⅘ of the real amount present.

The McKinley Bill and Smuggling.—What a profitable business smuggling will be after the McKinley bill shall have passed. Of course it is wrong; but look at the inducements! profits reaching from 50 to 200 per cent., and 10,000 miles of coast line, and 4,000 miles of land frontier upon which to conduct operations!—*Phila. Record.*

Official Memoranda.

(From the Board of Trade Journal.)

WOOD-PULP INDUSTRY OF SWEDEN.

HER Majesty's Consul at Stockholm, in his last report on the trade of that capital, says that the manufacture of wood-pulp as a natural product of the country has of late become one of the most important export trades of Sweden. At present there are somewhat more than 120 wood-pulp factories in Sweden, of which about half that number have been started during the last three years.

During 1889 alone 34 new factories have been established.

The export from Stockholm compared with the export of last year shows an increase of 6,617 cwt., or about eight times the quantity then exported. The export of the whole of Sweden, which in 1872 only amounted to 114,000 cwt., amounted during 1889 to more than 988,000 cwt. The prices have been constantly declining, but new and improved methods in a like proportion lowered the working cost, and several factories have shown excellent results during latter years. A great number of the factories have been started at places where the iron manufacture has proved a failure. The present improvement in the latter trade, and the heavy increase in the price of charcoal, may, however, cause a decline in the wood-pulp trade.

WINES OF SOUTH GERMANY.

The French Consul at Mannheim states, in the *Moniteur Official du Commerce* for 15th August, that the best qualities of the wines of the Palátinate for 1887 and 1886 are almost exhausted. Quite recently for 1,000 litres of 1886 wine were paid from 1,700 to 2,000 marks, for the same amount of 1887, 950 to 1,400 marks, and of 1888, 600, 700, and 900 marks. The demand for last year's wine remains steady. The cold and damp weather of the present summer has damaged the vines on the high plateaux, where the best kinds were in full flower, and it is these which bear least a sharp temperature. Nevertheless a good vintage is expected, at all events so far as quantity is concerned. In Baden the vineyards of Brisqau and Kaiserstuhl have suffered from the weather, but not to such an extent as to disturb the condition of business. In the vine district of Markgräflorland the flowering was not successful.

ALCOHOLIC PRODUCTION IN GERMANY IN 1888-89.

The April number of the *Statistics of the German Empire* for 1890, contains the results of the manufacture and taxation of alcohols in Germany during the period from the 1st October 1888 to the 30th September 1889, that is to say, during the second year of the application of the law of the 24th June 1887, on the taxation of alcohols. The German alcoholic community, that is to say, the whole of the German States where the law is in force, was extended in this period (15th October 1888) by reason of the annexation to the Zollverein of the States of Hamburg, Bremen, and some Prussian and Oldenburg districts. The territories annexed contain 56 distilleries, 51 of which are in work, and which have produced, since the date of annexation up to the end of the period, 78,000 hectolitres of pure alcohol.

Altogether, the alcoholic commonwealth contained in 1888-89, 65,652 distilleries in work, against 48,415 during the preceding year; of this number 9,992 distilled from farinaceous substances (against 11,652 in the preceding year); 18 from molasses (against 19 the preceding year); finally, 55,642 distilled other different substances (against 36,744 the preceding year).

It is chiefly the potato distilleries whose number has diminished from 6,268 in 1887-8. It has fallen to 5,145, whilst the number of fruit distilleries (pip fruits, nut fruits, different berries) has increased by reason of the abundance of the crop in 1888.

The production of pure alcohol has increased to 2,727,051 hectolitres, against 3,058,025 in the preceding year. Of this quantity the potato distilleries have produced 2,080,977 hectolitres (2,534,708 the year preceding); the cereal distilleries, 532,321 hectols. (427,387 hectols. the year preceding); the molasses distilleries, 77,010 hectols. (75,002 hectols. the year preceding); lastly, the fruit distilleries, 36,753 hectols. (20,928 hectols. the year preceding).

The small production of potato distilleries must be attributed to the fact that potatoes were not so abundant and somewhat high in price.

The distilleries manufacturing spirits from lees have produced 441,122 hectols. of pure alcohol, against 327,605 hectols. in the previous year. This large increase results from the annexation to the Zollverein of the aforementioned States or districts, and which contain important distilleries of this kind.

The quantity of alcohol consumed in the interior of the Empire has increased to 2,178,719 hectols., against 1,683,736 hectols. in the preceding year.

But it must not therefrom be deducted that the requirements of the population have increased in such a large proportion; large stores of brandy were made before the entry into force of the new law (1st October 1887), and these stores being now exhausted, recourse is increasingly had to alcohols of more recent manufacture and subjected to new taxes. That is the cause of the increase in the statistics.

The quantity of alcohol exempted from taxation, by reason of its use for industrial purposes, has increased to 431,294 hectols. (337,568 hectols. in the preceding year).

At the end of the year 1888-89, the quantity of German alcohol bonded and not having paid duty amounted to 340,866 hectols, against 491,873 hectols. in the preceding year.

The imports of foreign spirits into the Zollverein have increased to 25,721 quintals of arrack, cognac, and rum; 711 quintals of alcohol, and 3,521 of other spirits.

The exports on the other hand have amounted to 257 quintals of arrack, cognac, and rum, and 178,718 quintals of alcohol, of which 172,382 quintals, or 158,235 hectolitres were pure alcohol. The preceding year the export of pure alcohol were 417,556 hectols.; the large diminution in these exports is attributed to the high duties imposed in Spain and France on alcohols imported.

THE CULTIVATION OF CASTOR OIL IN SENEGAL.

The French *Moniteur Officiele du Commerce*, for August 14th, publishes a report which the French Colonial Office has received from M. Carstaing, on the subject of the cultivation of the castor-oil plant in Senegal.

In June, 1888, M. Carstaing drew the attention of the Governor of the French colony of Senegal to the advantages which would accrue from the cultivation of the indigenous castor-oil plant, particularly the species which spontaneously decorticates itself in the sun, and which M. Carstaing had discovered in his entomological rambles. The Government agreed to undertake experiments in this direction, and at the end of June 1888, 10,000 seeds were sown in a plantation at Sor, near St. Louis, and 6,500 were distributed to private persons to experiment upon, at the public cost.

The extreme dryness of the climate had prevented the success of several other attempts of a like kind, such as those with arachides nuts, millet, and beans. It was fortunately found that the castor-oil plant was able to resist this obstacle, and in its first season the plantation at Sor produced 300 kilos. of good seeds. In May, 1889, other plantations of castor oil were founded at Dakar-Bango, Louga, Kelle, and Thiès. By the close of December, 1889, the Government was able to announce that these new areas of cultivation had proved twice as successful as anyone had dared to hope. The plants had in six months grown, at Thiès and elsewhere, to a height of from 3 to 4 metres, with a rich crop.

During the rainy season of the present year a great number of applications have been made by planters in various parts of Senegal for seed of the best quality, and fresh plantations have been opened with 1889 seed in Rufisque, Gorée, and other places. It has been so clearly shown that the soil and climate of Senegal are favourable to the growth of the castor-oil plant, that preparations are being now made for a very wide cultivation of it throughout the colony in February, March, and April of next year. The principal difficulty in the way of this new industrial enterprise is the resistance of the natives, who cannot be persuaded that arachides nuts, and castor oil can be simultaneously grown in the same piece of ground. This is quite a mistake, however; by planting the castor-oil plants of the first year sufficiently sparsely, success is certain.

The principal trading houses of Bordeaux and Marseilles have promised to support the colony of Senegal in the cultivation of castor oil, by offering a market for the product. They consider that the new industry will prove a source of immense wealth to the colony, the present prices being highly advantageous. The accident that the crops of arachides nuts have lately been a failure make the Administration of Senegal only the more anxious to secure this new and valuable product. Offers have already reached St. Louis from two American houses, and it is believed that the colony will have no difficulty in selling all that it produces.

The numerous uses to which castor oil is now put are very encouraging to the cultivation of the plant. It can be utilised, besides in its medicinal capacity, in dyeing, soap making, greasing machinery, lighting, printing, the manufacture of Dutch cheese, exported butter, for cement in Java, and for food in China; the Chinese boil castor oil with sulphate of alum and sugar to remove the bitter taste.

CAMPHOR TRADE OF FORMOSA.

In an article on the camphor trade of Formosa the Calcutta *Englishman*, for the 1st July, says:—

Camphor forms the chief article of export in Formosa, but of late years, owing to hostilities between the Chinese who collect it and the aborigines, there has been a great falling off in the trade. Formerly the Chinese settlers had no difficulty in cutting down the trees, as they found them in the hilly districts adjoining their own property, but as they never thought of replanting they were soon forced to penetrate into the interior, where the fierce aborigines declined to be pushed out

of their possessions. In 1878 the export of camphor was 13,305 piculs, but for the last few years it has barely averaged 4,000 piculs, and this year it is said to be exceedingly small. The Chinese Government have always regarded the camphor trade as a monopoly, and have let it out on contract. This year there is said to be great difficulty in procuring camphor in Shanghai, and housekeepers putting away their woollen and fur goods for the hot season have to pay more than three times the usual price for the aromatic gum abhorred by moths.

CAPE OF GOOD HOPE.

MODIFICATION OF CUSTOMS REGULATIONS.

By virtue of section 5 of the Customs Union Tariff Act of 1889, the Governor has directed it to be notified that from and after 8th August last rebate to the extent shown in the schedule below, shall be granted in respect to such articles as are in the said schedule whenever any such articles shall be removed overland to British Bechuanaland and the South African Republic, provided that such articles shall only be removed in accordance with such regulations as the Governor may from time to time prescribe.

SCHEDULE.

Articles.	Rebate to be Granted.	£	s.	d.	Duty less Rebate to be Paid.	£	s.	d.
Dynamite	Per pound	0	0	2		0	0	1
India-rubber, unmanufactured	For every £100. value	12	0	0		Nil.		
Iron, bar	,,	10	0	0		Nil.		
Do., bolt and rod	,,	5	0	0		5	0	0
Do., sheet (not corrugated)	,,	12	0	0		Nil.		
Lead (tea)	,,	12	0	0		Nil.		
Metal, composition and sheathing	,,	10	0	0		Nil.		
Oil, paraffin and linseed	Per Imp. gall.	0	0	9		0	0	3
Do., other than the preceding (not chemical, essential, perfumed	,,	0	0	6		0	0	6
Do., chemical, essential and perfumed	For every £100. value	10	0	0		5	0	0
Ores and minerals, crude	,,	12	0	0		Nil.		
Resin	,,	5	0	0		5	0	0
Salt	Per ton of 2,000 lbs.	0	3	6		0	1	6
Soap, common, brown, blue, yellow, or mottled	Per 100 lbs.	0	3	5		0	0	9
Soda, caustic	For every £100. value	5	0	0		5	0	0
Spirits of all sorts (other than Hollands gin), not exceeding the strength of proof by Syke's hydrometer, and so on in proportion for any greater strength	Per Imp. gall.	0	10	0		0	0	6
Spirits, commonly known as Hollands gin, not exceeding the strength of proof by Syke's hydrometer, and so on in proportion for any greater strength	,,	0	10	3		0	0	3
Spirits, sweetened or perfumed, liqueurs, and cordials	,,	0	10	0		0	0	6
Steel, bars, ingots, pigs, plates	For every £100. value	12	0	0		Nil.		
Tallow	Per 100 lbs.	0	2	8		0	1	6
Tin, block, ingot, plate, sheet	For every £100. value	5	0	0		Nil.		
Turmeric	Per 100 lbs.	1	4	0		0	1	0
Turpentine	Per Imp. gall.	0	0	10		0	0	2
Varnish	,,	0	0	6		0	0	6
Vinegar	,,	0	0	5		0	0	1

CUSTOMS TARIFF OF THE GOLD COAST.

The following is a statement of the rates of duty now levied under the Customs tariff of the Gold Coast on articles imported into that colony :—

Classification of Articles.	Rates of Duty. £	s.	d.
Gunpowder, per lb.	0	0	6
Lead, per lb.	0	0	0½

The undermentioned articles are charged with an *ad valorem* duty of 10 per cent. :—

Kerosene and other illuminating oils.
Perfumery.
Soap.
Sugar

The following articles are admitted duty free :—

Acids.
Blue indigo.
Instruments, scientific.
Chalk.
Chemicals.
Pitch and tar.
Quicksilver.
Tallow.
Blacking.
Glassware.
Candles.
Charcoal.
Oils, except kerosene and other illuminating oils.
Spirits, methylated, unfit for drinking, and not to be used for strengthening other spirituous liquors.

FAULTS IN GLASS AND THEIR RECOGNITION.

By APPERT AND FOUQUÉ.

IT is frequently very difficult to account for faults in glass or glazes, although their accurate diagnosis is of great importance, as they cause such a great diminution in the value of the article in which they occur. The following interesting communication has been made to the "Societé des ingénieurs civils," by Appert, concerning the observations which he and Fouqué have made on this subject. Bubbles and minute specks arise from imperfect working after fusion, or from lack of care on the part of the workman in cutting out the "bull's eye," or in casting and forming particles of organic matter getting into the mass. When the bubbles are enclosed during the working of the glass, and the heat is not raised sufficiently to drive them out, the glass becomes full of specks and falls very considerably in value. Faults of this kind are very easy to detect, and may be seen with the naked eye, or very clearly by the aid of a lens. When organic dust gets into the mass, and is there decomposed by the heat, gases are given off which appear to cause grey spots, this variety of fault being known as "crachat." These faults are everywhere met with, and can be avoided by a properly conducted fusion and working up; and Appert has therefore not included them in his investigations.

Faults of another class may be caused (1), by imperfect mixing of the raw materials (2), by fusing at too low a temperature, portions of the mixture having stuck together and escaped complete fusion. In this way, spots remain in the glass, just like those which are formed where small pieces break off from the walls of the pot and get into the fused gas. (3). These spots may also be formed from the glass itself, and be caused either by its composition or by the temperature to which it has been exposed during the various stages of its manufacture.

Appert and Fouqué have endeavoured to establish a means of recognising these various blemishes, by studying their sections under the microscope. They first make a section of the glass or glaze in question, about 0·03 m.m. in thickness and mount it with Canada balsam on a glass slide which serves simply as a holder. The sections are then examined by transmitted light under the microscope with a power of 300·800 diameters. This process has been frequently used, e.g. by Sorby (1856-1858), an English mineralogist, by Zirkel (Leipzig), by Rosenbusch (Heidelberg), and finally Fouqué and Lévy. The character of the microscopic crystals and the nature of their constituents can be recognised in a few minutes. The examination is conducted first in ordinary, and then in polarised light.

The mineral which is most generally found in glass in this way is quartz. If this is detected, the next thing is to ascertain whether alumina is present. This occurs as a greyish luminous mass surrounding the quartz, and its presence shows that the spot is caused by an anhydrous aluminium silicate, which has not dissolved in the glass, and is derived from the melting pot. When the quartz is alone, the fault is due to the composition of the mixture, the mass having been either insufficiently mixed or too viscid. Artificial crystals of various minerals, resembling the natural crystals, are often met with, their nature varying with the composition of the glass. The most important of these is wollastonite, a double silicate of calcium, which is generally formed after slow cooling and denitrification. When slowly cooled, lime glass tends to decompose, and, keeping this tendency in view, the workman must try to avoid variations in the temperature of his furnace, especially a sudden fall, since the value of the glass is lessened by these crystalline specks. The alkaline earths are often used for the sake of cheapness in bottle glass, and the wollastonite is then found to be accompanied by aryite crystals (calcium magnesium silicate). Under other circumstances, Appert found metilite and Humboldtilite.

He expresses the opinion that such glass is not suitable for making bottles to hold liquors such as wine, beer, etc., because it has been observed that all glasses in which crystalisation has commenced are readily attacked by the weakest acids, even by very dilute acetic acid.

Finally, crystals of felspar (oligoclase or labradorite) have also been detected in glass.

The investigation of the phenomena of denitrification has led Appert to the conclusion that the crystalline substances found in the glass can in certain cases be much less acid than the glass from which they have separated. In a glass containing 68-75% of silica, for example, Appert and Fouqué have found crystals containing only 50–56%, just as is the case in blast furnace slags. The inverse phenomenon has also been observed, the crystals being more acid than glass, and in some cases crystallised silica has been found in the form of tridymite.

Fouqué has completely denitrified samples of various typical glass by continued heat, and has proved the presence of compounds of definite composition in the resulting masses.

To conclude with, Appert mentions the following experiment:—A glass containing iron, which was only very feebly magnetic, was converted by denitrification into a strongly magnetic mass, a proof that a new substance—crystallised oxide of iron—must have been formed in the glass at the high temperature to which it had been submitted for a long time.—*Moniteur de la Ceramique et de la Venerie.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

B. B.—Thanks for your letter, we have inserted the correction.

T. H.—Not necessarily litho-fracteur, any of the dynamite preparations will do.

Volta.—About three volts, try three Leclanches.

B. W. & Co.—We have no information respecting the person, if he comes again ask for the letter he mentioned.

Oxychlor.—About 12 per cent. available, if you get this you will do very well.

J. P. H.—The slack is too high in per cent. ash, try to reduce this by getting from somewhere else.

H. V.—If the firm *guarantee* it and are a respectable firm, why not try it, of course there are boiler compounds *and* boiler compounds.

BACK NUMBERS OF THE CHEMICAL TRADE JOURNAL.

NOTICE.

As we shall shortly clear out our stock of odd numbers of the earlier volumes of the Journal, those of our readers who require back numbers, to complete their sets, should apply for the same not later than October 4th. Some of the numbers are out of print.

NOTICE.

We have decided to commence a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

October 7th.—"Manufacturing Smoke."
November 4th.—"Domestic Smoke."
December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the first lecture—"Manufacturing Smoke"—the chair will be taken by Alfred E. Fletcher, Esq., Her Majesty's Chief Inspector of Alkali, &c., Works; and models of various appliances will be exhibited.

Tea and coffee at 6-30 p.m. in the Exhibition room.

As the lecture room was much crowded at our last gathering, many visitors who arrived late being unable to find room, we have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

Trade Notes.

Obituary.—Mr. Andrew Geo. Kurtz, alkali manufacturer, Mossley Hill, Wavertree, and St. Helens, died at the Queen's Hotel, Aberystwith, at two o'clock on Saturday morning. He had been ill only a few days. Mr. Kurtz was 65 years of age and unmarried.

Dividends.—The directors of the Glenboig Fire-clay Company recommend a dividend of 10 per cent. A dividend of 12s. per share, at the rate of 5 per cent, has been declared by Messrs. Sadler and Co., Limited, Middlesborough.

Sowerby Bridge Gas Contracts.—The tender of Messrs. Bradbury and Hirsch, Liverpool, for the purchase of sulphate of ammonia, has been accepted by the Sowerby Bridge Local Board; also the tender of Messrs. E. and W. H. Haley, Bradford, for the supply of special castings.

Errata.—A correspondent has drawn our attention to a probable error in the "New Method for the separation of Zinc from Iron and Manganese," by T. Riban, p. 173 of the current volume. He says: "It is stated that the metal is precipitated as sulphide in presence of thio sulphuric acid. I feel tolerably certain that this is a mistake for dithionic acid, the alternative name for which – hyposulphuric acid is calculated to deceive the unwary."

Rendering Texture Indestructible.—A method has, it is said, been discovered by a Belgian chemist for rendering texture, no matter how delicate in fabric or colour, proof against the ravages of decay. The chemist referred to made certain experiments with the substance extracted from birch bark, to which the peculiar aroma of Russian leather is due, and he found that the green tar, which was left over after the oil used in tanning had been extracted from the white bark of the birch tree, yields neither acid nor alkaloid, and that in solution with alcohol it forms a liquid of remarkable fluidity with the power of resisting when once dried, even the action of alcohol.

Devulcanised Rubber.—Manifold have been the devices and experiments that have been tried for reclaiming rubber that has been vulcanised; but few have reached the perfection of an analytical chemist, who has submitted a sample of his reclaimed rubber to us during the past few days. To use his own words, he claims to have discovered a means whereby any old rubber can be completely and efficiently treated, so that any admixture of pigments, substitutes, vulcanising material, used in the manufacture can be completely removed, leaving the pure rubber in exactly the same state as it originally was.—*Exchange.*

Action of Light on Alizarine Colours.—The alizarine, or so-called alizarine colours, are generally regarded as being fast to light, This idea, however, has been dispelled by some experiments made by O. Muller, who finds that four months' exposure to light, destroys galloflavine, galleine, alizarine blue SR, anthracene brown, alizarine maroon, and alizarine indigo blue, when dyed on a basic chromium chloride mordant; alizarine blue F, alizarine brown, and gallein when dyed on a chrome alum mordant; and gallein when dyed on aluminum mordant. The only fast alizarine colours are alizarine orange and alizarine. Anthracene brown, coeurline S, alizarine blue DN, alizarine blue R, are slightly affected. The resistance of these colours to acids and alkalies is satisfactory.

The Salt Trade.—In the monthly return of the salt trade, just published, it is stated that August has not been so satisfactory as was expected, owing to some large shipments not being completed till the first days of September. In fact, the shipments are the smallest for the last ten years. The exports of white salt during the month amounted to 60,522 tons, as compared with 65,018 for the corresponding period of last year. The average for the 10 years is 89,163 tons. Of rock salt 4,525 tons have been sent abroad. Though the West Indian shipments have been small, and those to South America about an average, the amount sent to Africa is the largest yet registered in one month, being 60,890 tons. To the British North American ports the exports have been very fair; Northern united ports rather small; but to Southern ports considerably more than formerly.

Liquid Carbonic Acid.—At Krupp's works, at Essen, liquid carbonic acid, CO_2 is used in heavy gun-making. Krupp discovered that by casting steel under pressure (some 1,000 lb. to the square inch), and rapidly cooling the metal by means of carbon dioxide, he could obtain heavy pieces free from defects. The pressure of 1,000 lb. to the inch is obtained by heating the vessel containing the liquid up to 30° Centigrade. It has been found by experiment, that by heating up the liquid to 2,000° Centigrade, a pressure of 18,000 lb. to the inch may be obtained. The Krupp guns are built up of three cylinders, shrunk one on another. The cold portion, over which the heated cylinder is being forced, is kept cool during the operation by means of the cold resulting from the expansion of the liquid into the gaseous form. In like manner, in breaking up an old gun, the steel core is, by the same means, reduced to a very low temperature, the shrinkage due to which loosens the core and allows it to be drawn out.

New Fast Yellow Colouring Matters.—The Clayton Aniline Company have patented the production of new fast yellow colouring matters capable of dyeing unmordanted cotton. When sulphur is heated with paratoluidine, two bodies are produced, named respectively dehydrothioparatoluidine and primuline base, the properties of which have been described by A. G. Green in the Journal of the Chemical Society. These bodies are capable of being converted into colouring matters; in this way the dehydrothioparatoluidine is converted into its sulphonic acid by treatment with sulphuric acid; this is then diazotised and then combined with another quantity of the same sulphonic acid; or the base is dissolved in sulphuric acid, and after azotising combined with the dehydrothioparatoluidine sulphonic acid. The colouring matters, as sent out, are the sodium salts of the sulphonic acids so formed; and they will dye unmordanted cotton a fast yellow. They are soluble in water, from which the free sulphonic acid can be precipitated by adding acids. Alkalies turn the yellow colour to red.

Improvements Relating to the Production of Malt.—This Bavarian invention deals with the manufacture of colour malt. The chief novelty consists in the conversion of the starch of the malt into sugar, previous to caramelization. Charring of the grain is altogether avoided, and as a consequence, beer brewed with this malt is altogether free from any burnt flavour. In practice, "green malt" is placed in a revolving cylinder or "toaster," and moistened with 9 to 10 pints of warm water per cwt. of malt taken. The toaster is kept in constant rotation, the temperature inside it not being allowed to exceeed 100° C. In about two hours the starch of the malt is converted into sugar. Thereupon the temperature is somewhat raised, and the rotation continued for about five hours more. By this means the sugar is more or less completely caramelized, although the husk of the malt hardly darkens at all. Finally, the malt is thrown out of the toaster, and heaped on a floor, preferably of stone, to cool. After removing the "comes" and cleansing, it is ready for use.

The Electrical Production of Caustic Soda.—The principal chemicals used by paper manufacturers are caustic soda and chloride of lime, or bleaching powder, and these two substances constitute items of considerable expense in paper mills. For some time past it has been hoped that these two chemicals would be obtained directly and economically from common salt by the aid of electricity. Many attempts have been made in the past to effect this object, but we believe they have all ended in failure. This has probably been due to one or the other of two causes—namely, either a deficient knowledge of the laws regulating electric currents or badly-constructed tanks and apparatus for effecting the decomposition economically. The practice has been to separate the products of electrolysis by porous plates or diaphragms, which offer considerable resistance to the passage of electricity and add to the general cost of useful work done, and are in other respects objectionable. At length, however, it would appear that caustic soda and bleaching powder can be, and indeed are, being practically and economically produced from common salt by the aid of an electric current. This desirable end has been attained by Mr. James C. Richardson, of 23, Claremont-square, London, whose process has been in operation on a working scale for several months past at one of the largest paper mills in the kingdom. The whole apparatus is automatic, the salt solution passing regularly and the caustic soda being drawn off at any strength up to 10 or 12 per cent. pure caustic soda. The chlorine, which can also be used direct for bleaching, is absorbed by slaked lime, and bleaching powder is thus produced. We are not at present at liberty to give any details respecting this process, but we may mention that it is not simply a method of producing a bleaching solution by electrolyzing salt, but a commercial process of producing these two important chemicals. The porous partitions are altogether dispensed with in Mr. Richardson's apparatus, and in other respects it differs materially from that employed in previous attempts to effect the same object. It is stated that the cost, both electrically and commercially, is much below that of the ordinary Leblanc process of alkali manufacture, and that at least three times the amount of chlorine is available from each ton of salt decomposed as against that process. Thus a larger quantity of bleaching powder is produced and the purity of the caustic soda ranges very high. The erection of enlarged plant is being proceeded with at the works where it is already in operation, and the adoption of plant is contemplated at the works of a few other leading paper manufacturers.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

The firmness of the market is maintained in all products of the alkali trade with the exception of bleaching powder, which has been somewhat easier, and is obtainable on the spot at £5. 5s. to £5. 7s. 6d. per ton for makers' works, and £5. 15s. to £5. 17s. 6d. f.o.b. For caustic soda the prices have gone to a higher point under pressure of demand, which stocks have been unable to meet; prices this week are for 77% £13. 5s. to £13 10s. per ton; 74% £13. per ton; 70% £11. 12s. 6d. per ton; 60% £10. 10s. per ton. Soda ash is still firm at 1 5/16d. for carbonated, and 1¼d. to 1 5/16d. for caustic ash. Soda crystals remain steady at prices of the previous week. Chlorate of potash firm at 5d. per lb. There has been increased enquiry for sulphate of copper, more particularly for forward deliveries, and prices ruling are, for prompt £19. 15s. per ton, and forward £21. to £22., according to delivery. Sulphur vitriol and muriatic acids are all in good demand and without change in prices. Acetate of lime (brown) is in better request at £7. 5s. per ton and grey at £12. 15s. Acetate of soda is more enquired for and has a firmer tendency, Acetic acids of all kinds are steady in price and in good demand. Potash, caustic, and carbonate continue scarce, and stocks being insufficient to cover present demand the prices are consequently firmly maintained. Prussiate of potash is very scarce and prices are 9¼d. to 10d. Carbolic acid crystals are a shade easier. Aniline oil and salt continue firm in sympathy with the market for benzol. White sugar of lead is rather dearer owing, to advance in the metal. Nitrate of lead does not show any improvement and is still selling at £21. 10s. to £21. 15s. at usual points of delivery. Bichromates of potash and soda are selling freely as advised at prices and discount recently reported, and there does not appear to be any outlook for early improvement.

REPORT ON MANURE MATERIAL.

There has been a moderate business passing but without material change in values, except in nitrate of soda, which closes at any advance.

There is nothing fresh to report in mineral phosphates: prices remain as last quoted.

We do not hear of any fresh business in River Plate cargoes of bones to U.K., but we understand that several transactions have been concluded for the United States. For U.K. sellers require £5. 12. 6d. delivered; £5. 12s. 6d. paid for crushed Calcutta bones shortly due. £5. 15s. asked for crushed Kurrachees October-November steamer shipment. Nothing fresh to report in bone meal, prices rather precluding buying. Sellers will not entertain under £5. 17s. 6d. for East Indian in any position. On spot parcels of grinding bones sell readily at £5. 2s. 6d. to £5 5s. ex quay, Liverpool. Bone ash remains firm at £5. 7s. 6d. on 70%, nett cash Hamburg terms, for cargoes to U.K. or Continent.

The market for horn piths continues to improve, £5. 12s. 6d. having been paid for Brazils. Nitrate of soda is very firm in all positions, 8s. 6d. is lowest *on spot* for ordinary quality, 8s. 7½d. for refined, 8s. 6¾d paid for cargo shortly due, and further buyers at the price. October-November shipments are worth fully 8s. 10½d. for ordinary quality.

Nothing to report in dried blood, or ground hoof.

Superphosphates firm at last quotations.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron: Scotch warrants closed at 51s. 8½d. cash, and 51s. 11½d. one month. Middlesbrough, 48s. 9d. cash; hematite, 58s. 3d. cash. Settlement prices:—Scotch, 51s. 9d.; Middlesbrough, 48s 9d.; hematite, 58s. 3d. Copper easier. Chili bars, G.O.B.'s and G.M.B.'s closed at £60. 17s. 6d. to £61. 5s. cash, and £61. 5s. to £61. 12s. 6d. three months. Tin firmer: Straits closed at £102. 10s. to £103.; Australian, £102. 10s. to £103. Straits three months, £100. to £100. 10s. Lead: Spanish, £13. 12s. 6d.; English, £14. Spelter: Silesian ordinary, £25. 5s. Quicksilver, £10. 10s. first hand, £10. 6s. second. Copper shares: Rio Tinto fell 5/16 to 26¼; Mason and Barry, fell 9¾ to 9 11/16; Cape, 5 1/16 Namaqua, 3⅜.

GLASGOW, Wednesday.—Market still flat. with a large business. Scotch done at 51s. 10½d., 52s. 1d. 51s. 10½d., and 51s. 11d. cash, also at 52s. 1¼d., 52s. 4d. and 52s. 2½d., one month; closing buyers at 51s. 11d. cash. sellers ask ½d. more. Middlesbrough done at 48s. 9d. nine days; closing buyers at 48s. 9d. cash, sellers ask 49s. Hematite done at 58s. 4½d., 58s. 1d., and 58s. 3d cash, also at 58s. 10d., 58s. 3d., and 58s. 6d. one month; closing buyers at 58s. 3d. cash, sellers ask 58s. 4d.

WOLVERHAMPTON, Wednesday.—The probable course of wages is the subject occupying the attention of the Staffordshire iron trade just now. This will depend on the average selling price of iron during July and August, which is to be declared at a meeting of the Wages Board on Monday. Opinions differ as to whether a rise or a decline will be shown, but iron masters declare they cannot afford to pay higher wages. Bars are £8. 10s. for best qualities, and galvanised sheets command £13. for 24 gauge. Pigs in good sale.

THE LIVERPOOL MINERAL MARKET.

Our market has ruled very steady during the week, and practically there is no change to report in prices. Manganese: Arrivals have been rather under the average, and prices have ruled steady, both for prompt and forward delivery. Magnesite: There is no reduction in stocks, and no alteration to report in prices, which are in favour of buyers; raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground, £11. Bauxite (Irish Hill brand): The production is not able to keep pace with the demand, and prices, therefore, have improved; Lump, 22s.; seconds, 18s.; thirds, 14s.; ground, 35s. French chalk has ruled very steady during the week. There have been more arrivals, but most having gone into consumption prices are unaltered, especiallly for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Both carbonate and sulphate are in fair demand, without any alteration to report in prices. Pumicestone unaltered: ground at £10., and specially selected lump, finest quality, £13. Iron ore easier; Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore quiet. Spanish manganiferous ore in fair demand. Emerystone unchanged. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal, are in request at advanced prices. Chrome ore quiet; prices unchanged. Antimony ore and metal in demand at full figures. Asbestos in strong demand, especially rock, and prices very firm. Potter's lead ore of best and standard brands in request; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: In good demand at 65s. to 80s. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, steady. Plumbago: Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay quiet—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), finest quality, 22s.

THE LIVERPOOL COLOUR MARKET.

Colours continue steady, with change in prices. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire, common, 40s., medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc without alteration. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron, common, £6.; medium, £10.; finest, £ o.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There is little change to report in chemicals this week. The market continues steady, and prices firm. There is a strong market for caustic soda, and makers are cleared out for this month. Bleaching powder continues quiet. Soda ash and crystals are practically unchanged. Sulphate of soda in more demand and price advanced.

Quotations are as follows:—Bleaching powder, in softwood casks, £5. 5s. to £5. 7s. 6d. per ton; 5s. per ton extra for hardwood; caustic soda, 77%, £12 per ton; ground and packed in 3-4 cwt. barrels, £15. per ton; soda ash, 48/52%, 1⅜d. per degree less 7½%; soda crystals, 56s. per ton; sulphate of soda, ground and packed in casks, 45s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton, all f.o.b. Tyne, or f.o.r. makers' works—

The demand for small coals for manufacturing purposes continues steady and in fair demand. Northumberland steam small, quoted from 6s. 9d. to 7s. 3d. per ton, and Durham small, 7s. to 8s. per ton, according to quality.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Sulphate of ammonia has been showing signs of weakness since the middle of last week, so far as this section of the market is concerned, and by Saturday it was done down to £11. 7s. 6d. To-day this is the topmost estimate, and as all holders seem willing to part at that figure and buyers are scarce, the probability is (and the expectation also) that the price will have to give way farther. With about this exception, Scotch chemicals are firm, and caustics, though easier towards the close, have again resumed the ascent, with a mount of about 5s. Bleaching powder has also been hardening, under Union reports favourable to a consummation of the project, although as regards this there are still many sceptics, both in the trade itself and amongst consumers. Bichromates, which are now manufactured and sold without any agreement between the three or four Scotch makers, have been evincing signs of instability, more and more since the rupture of the long standing convention, and although prices are at present as given below, the discounts allowed by the makers in competition are rather elastic, and run to figures at times in excess of those named. This has more particularly been the case in closing with foreign buyers for export. Chief prices current are:—Soda crystals, 56s. net Tyne; alum in lump £5., less 2½% Glasgow; soda ash, 1⅜d. less 5%, Tyne; caustic soda, white, 76°, £12. 10s., 70/72°, £11. 10s., 60/62°, £10. 10s., and cream, 60/62°, £9. 10s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £5. 15s., and 1 cwt. casks, £6., net Tyne; refined alkali, 48/52°, 1⅝d., less 2½% Tyne; saltcake, 35s.; borax, English refined, £30., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 7s. 6d. to £5. 12s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., less 5% f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. less 5% f.o.b. Glasgow; chlorate of potash, 5d., less 5% any port; nitrate of soda 8s. 6d. to 8s. 7½d.; sulphate of ammonia, £11. 7s. 6d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £19, less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3⅝d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less); ditto (lubricating), 865°, £5. 5s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 15,935 bags.

TAR AND AMMONIA PRODUCTS.

The benzol market is reported a bit quieter during the past few days, but evidently there is not much change, and prices remain unaltered. The solvent naphtha market is still firm with a fair demand, while anthracene prices quoted last week may be considered to hold good for to-day. The pitch season is now coming on again, and we shall soon hear of large shipments.

The sulphate of ammonia market is constantly being reported weaker, but this is owing to the tactics of buyers who have not covered over future delivery. The Gas Light and Coke Company have sold for some time forward at £11. 12s. 6d., and this is the value of outside London makes. Hull is variously quoted at £11. 8s. 9d. to £11. 10s. but it is not probable any could be secured at less than the higher figure. Leith is the weakest market of all the ports, and £11. 7s. 6d. is, to-day, the sellers price, while buyers will only pay £11. 6s. 3d. There is no occasion for any uneasiness, but much depends upon the way in which producers place their parcels upon the market.

New Companies.

BURYS AND COMPANY, LIMITED.—This company was registered on the 11th inst., with a capital of £89,660, in £10 shares, to acquire and take over the business of Burys & Co., Limited (incorporated in 1865), to carry on the business of steel converters, refiners, manufacturers of locomotive engines, &c. The first subscribers are:—

	Shares.
Fred. Fowler, St. James-street, Sheffield, land agent	1
W. Armistead, Great Chelford, Cambridge	1
R. W. Crudelius, Leith	1
T. Brown, 275, Glossop-road, Sheffield, steel manufacturer	1
George Hieatt, 50, Grove-terrace, Higher Broughton	1
Jno. Hawley, Wharncliffe-villas, Wadsley, near Sheffield, manager	1
Jas. T. Miller, 11, Roslin-road, Sheffield, cashier	1

ELMORE'S FRENCH PATENT COPPER DEPOSITING COMPANY, LIMITED.—This company was registered on the 10th inst., with a capital of £200,000 in £2 shares, to enter into and carry into effect an agreement made between Elmore's Foreign and Colonial Patent Copper Depositing Company, Limited, of the first part, Woodhouse and Rawson United, Limited, of the second part, and the company of the third part, to carry on in France and elsewhere, the business of manufacturers of

and dealers in copper and other metals, and all metallic alloys or compounds of the same, and all goods and articles made of copper or other metals and alloys; and to carry on the business of electricians, electrical contractors, electrical mechanical engineers, and suppliers of electricity, and of manufacturers and dealers in all apparatus required for or capable of being used in connection with the generation, distribution, supply, accumulation and employment of electricity. The first subscribers are :—

	Shares.
A. L. Broekman, 8, The Avenue, Brondesbury, clerk	1
T. E. Marsh, 42, Reighton-road, Clapton, electrician	1
G. Neath, 88, Queen Victoria Street, engineer	1
S. Rentell, 121, Vassall-road, Brixton. secretary to a company	1
J. Mumford, 50, Trinity-square, S.E., accountant	1
J. Moore, 46, Norroy-road, Putney, clerk	1
F. D. Summers, 81, Berwick-street, S.W., private secretary	1

J. & G. Meakin, Limited.—This company was registered on the 11th inst., with a capital of £200,000, in £100 shares, to acquire the business of an earthenware manufacturer, now carried on by George Meakin, at the Eagle Pottery and Eastwood Works, in Hanley and Stoke-upon-Trent, Staffordshire, and to carry on generally the business of earthenware manufacturers, flint and colour millers, and dealers in earthenware, china, etc. The first subscribers are :—

	Shares.
G. Meakin, Creswell Hall, Stafford	1
G. E. Meakin, Creswell Hall, Stafford	1
J. H. Meakin, Creswell Hall, Stafford	1
R. W. Young, Tillington, Stafford	1
M. Swinnerton, 5, Gladstone-place, Hanley	1
G. Nicholas, 105, Bucknall New-road, Hanley	1
T. Coldclough, 108, Bucknall New-road, Hanley	1
G. F. Paddock, Hanley	1

Sovereign Chemical Works (Hamilton & Company), Limited.—This company was registered on the 13th inst., with a capital of £10'000, in £1 shares, to carry on in the United Kingdom, the British possessions, and in any foreign country wheresoever, the business of manufacturers, merchants, and traders in agricultural and chemical produce, and to carry into effect an agreement between Frank Willisford Grierson and Henry Chas. George Hollingshurst, 98, High-street, Wandsworth (the vendors), agricultural and chemical manufacturers, of the one part, and the company of the other part. The first subscribers are :—

	Shares.
F. W. Grierson, 98, High-street, Wandsworth	1
H. C. G. Hollingshurst, 98, High-street, Wandsworth	1
R. J. Spetch, 24, Herndon-road, S.W., secretary	1
A. G. Brodie, 99, Grayshott-road, S.W., cashier	1
Wm. Wilson, 2, Strathmartine-terrace, Leytonstone, accountant	1
W. R. Curtis, 22, Ebness-street, Wandsworth, S W., shorthand writer	1
John A. Fraser, Richmond House, Caterham-valley, solicitor	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

E. Champneys, T. B. Harrison, and J. P. Johnson, under the style of the Lowdham Bone Mill Co., Gonalston, bone boilers and crushers; as far as regards E. Champneys.

C. T. Cuming and Son, Bradninch, paper manufacturers.

Steward and Westover, Kidderminster, chemists and druggists.

Dunham and Pollexfen, Horncastle, maltsters.

Adjudications.

Whittaker, Isaac, and Gill, Peter (trading as the Buckley Wells Brewing Co.) Bury, Lancs., ale and porter brewers.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Refrigerating Apparatus. J. A. Orme. 14,075. Sept. 8.
Smoke Prevention. R. Wallbank and J. Pollitt. 14,078. Sept. 8.
Manufacture of Hydrate of Alumina. E. Meyer. 14,084. Sept. 8.
Aerated Water and other Bottles. S. Switzer. 14 088. Sept. 8.
Apparatus for Heating Boilers, &c. H. C. Shaw. 14,104. Sept. 8.
Vulcanized Composition. R. F. Metzeller. 14,107. Sept. 8.
Apparatus for Aerating Liquids. W. Tice. 14,110. Sept 8.
Smoke Prevention. S. A. Johnson. 14,112. Sept. 8.
Artificial Fuel. H. H. Lake. 14,115. Sept. 8.
Refining and Heading Malt Liquors. G. Roskilly. 14.118. Sept. 8.
Utilization of Sewage Sludge. G. V. Alsing. 14,142. Sept. 9.
Electric Switches —(Complete Specification)—C. G. Perkins. 14,186. Sept. 9.
Smoke Prevention. R. Byrom and T. Bayley. 14,198. Sept. 9.
Manufacture of Glass. D. Rylands and H. F. Boughton. 14,211. Sept. 10.
Filtering Sewage. W. Birch. 14,212. Sept. 10.
Improvements in Furnaces. W. L. Wise. 14,240. Sept. 10.
Improvements in Furnace Grates. W. L. Wise. 14,241. Sept. 10.
Dry Concentration of Ores. C. S. Bailey. 14,243. Sept. 10.
Mechanical Stoking. W. Barnes and E. Manuel. 14,244. Sept. 10.
Apparatus for drawing off Measured Quantities of Liquid. A. E. Box. 14,251. Sept. 10.
Treatment of Sewage. A. O. Jones and S. Fox. 14,253. Sept. 10.
Treatment of Sewage. A. O. Jones. 14,254. Sept. 10.
Apparatus for Dressing Ores. R. D. Bowman. 14,279. Sept. 10.
" " Reducing Dressed Ores. R. D. Bowman. 14,280. Sept. 10.
Carburettors. G. Webb. 14,297. Sept. 11.
Manufacture of Refractory Bricks and Clay Ware. H. Bonnycastle and T. M. Rymer-Jones. 14,328. Sep. 11.
Electric Meters. Siemens Bros. and Co, Ld. 14,349. Sept. 11.
Dyeing, Sizing, and Washing Machines. J. Robertshaw. 14,372. Sept. 12.
Rotative Furnaces for Use in Cement Making. L. Johnstone. 14,380. Sept. 12.
Couplings for Glass Tubes and Glass-lined Tubing. D. Rylands. 14,388. Sept. 12.
Manufacture of Cement. C. V. Forell. 14,398. Sept. 12.
Dyeing Raw Cotton Aniline Black. E. T. Aucher. 14,399. Sept. 12.
Electric Switches. C. S. Snell. 14,404. Sept. 12.
Secondry Batteries. J. T. Niblett. 14,411. Sept. 12.
Coal Separators.—(Complete Specification) J. B. Pope. 14,414. Sept. 12.
New Amido-azo Compounds. J. Y. Johnson. 14,416. Sept. 12.
Substantive Cotton Colour. J. Dawson and R. Hirsch. 14,432. Sept. 13.
New Derivatives of Hydrastine and Narcotine. M. Freund and M. Heim. 14,437. Sept. 13.
Manufacture of Cement J. Clemenson and T. Clemenson.
Melting and Mixing Iron. C. While. 14,445. Sept. 13.
Smoke Prevention. C. H. Sidebottom. 14,448. Sept. 13.
" " —(Complete Specification.) T. T. Moore. 14,456. Sept. 13.
Improved Pressure Guage. J. Smith, S. Smith, and W. Smith. 14.473. Sept. 13.
Production of Soda and Chlorine. T. Raynaud. 14 483. Sept. 13.
Electric Switches. R. B. Evered and T. Rudling. 14,484. Sept. 13.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Sept. 13th.

Alum—
Holland, 45 pks. Ohlenschlager Brs.

Ammonia—
Holland, £97. Weatherley, Mead, & Co.

Antimony Ore—
Portugal, 41 t. H. Emanuel
Maryboro' 5 Vivian, Younger, & Co.
Austria, 97 Typke & King
Germany; 45 Cookson & Co.
" 29 Pillow, Jones, & Co.
Pt. Douglas, 4 t. W. Balchin
Germany, 5 Pillow, Jones, & Co.
Portugal, 2 Jose, Lord, & Co.

Acetic Acid—
Holland, 93 pks. A. & M. Zimmermann
" 38 Phillipps & Graves

Boracic Acid—
Italy, 20 pks. W. Nicolson & Co.

Borax—
Germany, £25. F. Stahlschmidt & Co.

Borate of Lime—
France, 1,200 bgs. Fardell & Co.

Bones—
U. St., 100 t. Mordaunt Bros.
Belgium, 20 E. Wilson

Barytes—
Belgium, 42 cks. Magee, Taylor, & Co.
Holland, 8 W. Harrison & Co.
Germany, 22 "
Belgium, 59
Germany, 25 Pillow, Jones, & Co.

Copper Ore—
Pt. Douglas, 29 t. W. Balchin

Caoutchouc—
Holland, 30 c. Prop. Bull Wf.
U. S., 1 L. P. D. Co.
France, 208 L. & I. D. Jt. Co.
U. S., 2 "
France, 3 Hoare, Wilson & Co.
Zanzibar, 34 L. & I. D. Jt. Co.
" 38 Hale & Son
Singapore, 208 Huttenbach & Co.
" 103 R. & J. Henderson
U. S., 143 Prop. Bull Wf.
Penang, 35 L. & I. D. Jt. Co.
Portugal, 17 Wallace Bros.
Singapore, 245 Kleinwort, Sons, & Co.
" 7 R. & J. Henderson & Co.

Cream of Tartar—
France, 5 pks. C. F. Gerhardt
Italy, 12 Sawer, Mead, & Co.
Holland, 30 Middleton & Co.
Italy, 10 Sawer, Mead, & Co.
Spain, 3 F. Smith
" 6 B. & F. Wf. Co., Ld.

Chemicals *(otherwise undescribed)*
France, £520. F. W. Berk & Co.
Germany, 400 A. & M. Zimmermann
" 325 "
Holland, 8 Phillipps & Graves
Germany, 684 A. & M. Zimmermann
" 127 T. H. Lee
" 75 H. J. Perlbach & Co.
" 212 Phillipps & Graves

Dyestuffs—
Indigo
Holland, 1 cht. A. G. Robinson & Co.
E. Indies, 10 A. Harvey
" 21 N. S. S. Co., Ltd.
Turkey, 1 L. & I. D. Jt. Co.
E. Indies, 4 "
" 12 F. Stahlschmidt, & Co.
" 11 A. Harvey
Cochineal
Canaries, 3 pks. Swanston & Co.
Tanners' Bark
Belgium, 50 t. Boutcher, Mortimore, & Co.
U. S., 11 Anning & Cobb
Holland, 20 J. Graves
U. S., 25 Anning & Cobb
Extracts
France, 61 pks. Prop. Chambln. Wf.
" 100 L. J. Levinstein & Sons
U. S., 60 W. Burton & Sons
Belgium, 7 T. H. Lee
Gambier
Singapore, 421 pks. L. & I. D. Jt. Co.
" 689 Beresford & Co.

Dyestuffs—*continued.*
Singapore, 209 pks. L. & I. D. Jt. Co
" 168 P. & S. Evans & Co.
" 748 R. & J. Henderson
" 429 W. H. Cole & Co.
" 1,110 L. & I. D. Jt. Co.
" 219 Brinkmann & Co.
" 219 A. Frey & Co., Ltd.
Penang, 111 W. H. Cole & Co.
E. Indies, 410 Cox, Paterson, & Co.
Singapore, 279 bgs. L. & I. D. Jt. Co.
" 727 Elkan & Co.
" 478 pks. Beresford & Co.
Safflower
E. Indies, 24 L. & I. D. Jt. Co.
Sumac
Italy, 100 Vokins & Co., Ltd.
" 10 G. S. M. Co.
Argols
Italy, 307 pks. Thames S. T. & L. Co., Ld.
Myrabolams
E. Indies, 700 pks. Prop. Sun Wf.
" 275 J. Farsey
" 275 Weatherley, Mead, & Co.
" 667 Lewis & Peat
Tumeric
E. Indies, 320 Major & Field
Saffron
Turkey, 1 cs. "
Spain, 1 pk. J. H. Fox & Co.
Dyestuffs *(otherwise undescribed)*
Austria, 4 bls. M. D. Co.

Glycerine—
Holland, £55 Phillipps & Graves
Germany, 105 Beresford & Co.
Austria, 650 Bailey & Leetham
Germany, 104 A. & M. Zimmermann

Gutta Percha—
Singapore, 136 c. Soundy & Son
" 54 Cundall & Co.
" 125 J. H. & G. Scovell
Holland, 230 Robinson, Roberts & Co.
" 23 Soundy & Son
Singapore, 337 Huttenbach & Co.
Penang, 5 L. & I. D. Jt. Co.
Singapore, 21 R. & J. Henderson
" 475 Kleinwort, Sons & Co.
" 250 Kaltenbach & Schmitz
" 535 J. H. & G. Scovell
" 235 Kleinwort, Sons & Co.
France, 14 G. le Doux & Co.
Singapore, 224 Kleinwort, Sons & Co.
" 860 H. W. Jewesbury & Co.
" 88 R. & J. Henderson & Co.

Glucose—
Germany, 10 pks. 90 cwts. Dutrulle & Co.
U.S., 30 177 R. G. Hall & Co.
" 70 281 Horne & Co.
" 50 300 Pillow, Jones & Co.
" 200 200 Barrett, Tagant & Co.
" 1,500 1,500 Union Lighterage Co Ltd.
Germany, 600 600 J. Barber & Co.
" 12 100 H. Lorenz
" 200 200 J. Knill & Co
France, 200 200 Trier, Meyer & Co.
Germany, 12 100 J. Knill & Co.
" 25 170 Pillow, Jones & Co.
" 25 243 Propr. Chmbln.'s Whf.
" 300 300 Baxter & Hoare
" 200 200 Dutrulle, Solomon & Co.
" 11 88 Prps. Chmbln.'s Whf.
U.S., 30 150 Hyde, Nash & Co.
" 210 1,050 T. M. Duche & Son
" 100 609 L. Sutro & Co.
" 99 594 R. G. Hall & Co.
" 75 434 Pillow, Jones & Co.
" 50 300 Page, Son & East
" 44 246 Howell & Co.
" 250 250 H. A. Litchfield & Co.
" 139 834 Botolph & Nichs. Whf.
" 75 380 D. Martineau & Son
Germany, 200 200 J. Barber & Co.

Isinglass—
Penang, 3 pks. E. Boustead & Co.
E. Indies, 2 L. & I. D. Jt Co.
" 5 "
Singapore, 2 W. M. Smith & Son
E. Indies, 2 Clarke & Smith
" 2 L. & I. D. Jt. Co.

Manure—
Holland, 49 t. Lawes Chemi. Manure Co., Ltd.
Germany, 50 Perkins & Homer
" 45 F. W. Berk & Co.
St. Valery, 130 A. Hunter & Co.
Holland, 135 Ang. Cntntl. G. Wks.
Belgium, 130 Odams Chemi. Manure Co.
Montreal, 204 C. A. & H. Nichol
Germany, 140 Anglo Cntntl. G. Wks.
U.S., 50 C. C. Bryden & Co.

Phosphate Rock
Montreal, 90 t. Anglo Cntntl. G. Wks.
B.W.I., 600 Pickford & Winkfield

Magnesia—
Holland, £170 Beresford & Co.

Manganese Borate—
Germany, 10 pks. Petri Bros

Manganese Ore—
Japan, 100 t. Elkan & Co.
" 10 Matheson & Co.

Nitre—
Germany, 3 cks. Craven & Co.

Naphtha—
Holland, 18 drs. Stein Bros.
" 15 cks. Lister & Biggs

Plumbago—
E. Indies, 200 brls. Prop. Chmbln.'s Whf.
" 613 J. Thredder, Son & Co.
" 94 Doulton & Co.
" 100 Prop. Chmbln.'s Whf.
" 13 Lambert & Strong
Germany, 18 cks. Fellows, Morton & Co.
E. Indies, 131 pks. R. G. Hall & Co.
" 171 brls. 513 cks. J. Thredder, Son & Co.

Pyrites—
La Laja, 600 t. G. Ward & Sons
Spain, 500 Forbes, Abbott, & Co.
La Laja, 500 G. Ward & Sons
Spain, 1,720 Société Commerciale

Pitch—
France, 70 cks. H. Hill & Sons
N. Russia, 700 Linck, Moeller, & Co.

Paraffin Wax—
U. S. 100 brls. E. & H. Holdsworth
" 90 G. H. Frank
" 4,592 J. H Usmar & Co.

Potassium Muriate—
Germany, 450 pks. F. W. Berk & Co.

Phosphoric Acid—
Germany, 25 pks. Phillips & Graves

Potashes—
Montreal, 128 c. Charles & Fox
" 223 S. Ward & Co.

Potassium Permanganate—
Germany, 20 pks. Beresford & Co.

Potassium Sulphate—
France, 17 pks. Weatherley, Mead. & Co,

Stearine—
U. S., 180 cks. L. & I. D. Jt Co.
Belgium, 63 bgs. H. Hill & Sons
France. 200 G Boor & Co.
Holland, 6 cks. J. H. Usmar & Co.

Soda—
Holland, £70. A. & M. Zimmermann

Sodium Silicate—
Germany £25. Beresford & Co.

Sodium Nitrate—
Holland, £55. Kaltenbach & Schmitz

Sodium Hypophosphate—
Holland, £30. F. Smith

Salammoniac—
Holland, £160. Barr, Moering & Co

Sodium Acetate—
France, 25 pks. Lister & Bigg

Saltpetre—
Germany, 3 cks Craven & Co.
" 44 P. Hecker & Co.
" 80 J. Hall & Sons

Tar—
N. Russia, 5,474 bls. Linck, Moeller, & Co.
" 500 Hoare, Marr, & Co.
" 370 R. G. Hall & Co.
Germany, 49 brls. W. Jacob, Son. & Co.

Tartaric Acid—
Holland, 6 pks. B. & F. Wf. Co.
" 47 Middleton & Co.

Ultramarine—
Germany, 8 cks. G. Steinhoff
Holland, 7 Haeffner, Hilpert, & Co.
" 7 pks. Ohlenschlager Bros.
Germany, 20 cks. H. Lambert
Holland, 32 Seaward Bros.

Verdigris—
France, £25. N. Steinberg

Zinc Oxide—
Holland, 30 brls. M. Ashby, Ltd.
" 20 cks. Prprs. of Dowgate Dk.
Germany, 50 brls. M. Ashby, Ltd.
Holland, 40 "
" 25 cks. Beresford & Co.
" 200 Soundy & Son
" 25 Burrell & Co.
" 20 Prprs. of Dowgate Dk.
Germany 40 brls. M. Ashby, Ltd.

LIVERPOOL.

Week ending Sept. 16th.

Antimony Ore—
Valparaiso, 80 sks. A Gibbs & Sons

Antimony—
Valparaiso, 47 cks. A. Gibbs & Sons

Bones—
Ceara, 237 bgs. Gunston, Sons & Co.
" 513
B. Ayres, 262 t. Mdreward, Kiduss & Co.
Valparaiso, 69 sks.
Callao, 416 E. Ayulo & Co.
Valparaiso, 169
Boston, 1 brl.

Barytes—
Antwerp, 11 cks.
" 23

Boracic Acid—
Leghorn, 60 cks.
" 16

Brimstone—
Catania, 200 t. R. Roberts, Son & Co.

Borax—
Valparaiso, 1,290 sks.

Cream of Tartar—
Barcelona, 5 cs.
Tarragona, 1 ck.
Barcelona, 10

Caoutchouc—
Para, 770 cs.
" 147 R. Singlehurst & Co.
" 21 Bieber & Co.
Havre, 100 R. Singlehurst & Co.
Accra, 1 pn. Perrin & Co.
" 2 cks. F & A. Swanzy
" 4 Pickering & Berthoud
" 5 Davies, Robbins & Co.
" 6 pks. 6 brls. Hutton & Co.
" 26 J. J. Fischer & Co.
" 1
" 39 cks. J. P. Werner
Salt Pond, 6 brls. Radcliffe & Durant
Cape Coast, 1 Davies, Robbins & Co.
" 2 cs. A. Herschell
" 15 Fletcher & Fraser
" 25 W. B. McIver & Co
" 1 C. Lane & Co.
" 23 A. Miller, Bros. & Co.
" 4 Grimwade Ridley
" 1 Tomlinson & Co.
" 1 9 Radcliffe & Durant
" 1 Pitt Bros
Manaos, 25 R. Singlehurst & Co.
" 218 " "
Para, 33 " "
" 29 Bieber & Co.
" 584
Winnebah, 2 pks.
Salt Pond, 2 F. & A. Swanzy
" 8 Pickering & Berthoud
" 1 W. D. Woodin
" 1 cs. Millerson & Co.
" 3 2 W. Griffiths & Co.
" 5 W. Symington & Co.
" 6 Radcliffe & Durant
Cape Coast, 2 A. Herschell
" 1 Davies, Robbins & Co.
" 15 Fletcher & Fraser
" 25 W. B. McIver & Co.
" 1 C. Lane & Co.
" 23 A. Miller, Bros. & Co.
" 4 Grimwade Ridley
" 1 Tomlinson & Co.
" 1 9 Radcliffe & Durant
" 1 Pitt, Bros. & Co.
" 17 Millerson & Co.
" 3 W. Duff & Co.
" 1 E. Wayland
" 6 Pickering & Berthoud
" 3 L. Hart & Co.
" 5 Ellis & Co.
" 15 C Callinor & Co.
" 6 Mordant Bros
" 5 35 C. Frease
Sierra Leone, 17 Cie. Francaise
" 4 Pickering & Berthoud
" 5 Palmo Trading Co.
Bathurst, 36
" 2 Cie. Francaise
" 3 A. Cross & Co.
" 12 A. Reis
Akassa, 479½ bgs. 2 cks. Royal Niger Co.
Addah, 8 cks. 2 cs. J. P. Werner
" 12 W. J. Rodatz & Co.

Caoutchouc—*continued.*
Addah, 1 cks. H. B. W. Russell
Ceara, 16 bls. Rosing Bros.
" 41 Leech, Harrison & Co.
Axim, 2 cs. 1 ck. Pickering & Berthoud
" 1 Millward Bradbury
" 6 1 Edwards Bros.
" 1 F. & A Swanzy
Gr. Bassam, 3 Pickering & Berthoud
" 3 W. D. Woodin
" 1 ck. Millward Bradbury
" 9 F. & A. Swanzy
" 3 3
Akassa, 37 bgs. Royal Niger Co, Ltd.
Quitta, 16 pns. J. H. Rayner & Co.
" 1 cs. 1½ hd. 1 brl. 2 pns. F. & A. Swanzy
Accra, 3 brls. 3 pns. J. J. Fischer & Co.
" 1 Davies, Robbins & Co.
" 6 Hutton & Co.
" 2 Pickering & Berthoud
C C. Castle, 1 ck. F. & A. Swanzy
" 4 A. Miller, Brs. & Co.
" 1 cs. 2
" 2 Millerson & Co.
" 1 Radcliffe & Durant
" 2 Mordant Bros.
" 1 Taylor Laughland
" 1 Challenor & Co.
" 3 J. Hutchinson & Co.

Copper Ore—
Lisbon, 124 t. Harrington & Co.
" 1,121 bgs.
Valparaiso, 538 sks. Brownells & Co.
Lisbon, a qty. Harrington & Co.
Leghorn, 170 t.
Montreal, 267 bgs. Allan, Bros & Co.

Carbon—
New York, 50 brls. G. Steinhoff
" 19 cs.
" 100 D. Crothers & Co.

Dyestuffs—
Cutch
Genoa, 5 cs.
Extracts
Trieste, 5 brls. S esel Bros.
Gambier
Singapore, 2,086 brls. E. Boustead & Co.
" 205 270 bgs.
Sumac
Fiume, 100 bgs. A. & W. Jackson
" 100
Barcelona, 50
Trieste, 50 Young & Strong
Palermo, 100 J. Kitchin, Ltd
" 100 H. Rooke & Son
" 1,200
Cochineal
Las Palmas, 6 bgs. D. Midgley & Sons
" 7 Swanston & Co.
" 6 N. P. Nathan & Co.
Saffron
Valencia, 1 cs.
Argols
Oporto, 33 cks. German Bank of London
Gambier
Singapore, 3,112 bls. 277 bgs.
Logwood
Jamaica, 219½ t.
Fustic
Salina Cruz, 119 t. Oetling Gebr.
Myrabolams
Calcutta, 725 pkts.

Glycerine—
Rotterdam, 1 dm. 5 cks. 13 cs. 6 crbys.

Glucose—
Hamburg, 52 cks.
Philadelphia, 40 brls.

Graphite—
Hamburg, 34 cks.

Horn Piths—
B. Ayres, 20,000 Williamson, Milligan & Co.
Saladero, 7,000 Argentine Meat Preserving Co.
B. Ayres, 308 t. Mdreward, Kiduss & Co.

Isinglass—
Parnahyba, 2 brls. 1 cs. Leech, Harrison & Co.
Para, 20 cs. Bieber & Co.
" 17 Hooton & Yates

Iodine—
Valparaiso, 202 brls. A. Gibbs & Sons
Manganese Ore—
Coquimbo, 1,147 t.
Manure—
Phosphate Rock
Montreal, 415 t. Phosphate of Lime Co.
Oxalic Acid—
Rotterdam, 8 cks.
Phosphate—
Montreal, 306 t. Phosphate of Lime Co.
Dunkirk, 202 t. R D. Steele & Co.
Ghent, 4,073 bgs. J. T. Fletcher & Co.
,, 680 t.
Valle, 416 J. T. Calphen
Montreal, 160 A. Hunter
,, 150 Canadian Phosphate Co.
Pyrites—
Huelva, 1,621 t. Tennants & Co.
,, 1,488 ,,
Plumbago—
New York, 1 brl.
Potash—
Rotterdam, 10 cks.
Prussiate—
Antwerp, 6 cks. J. T. Fletcher & Co.
Potassium Permanganate—
Hamburg, 10 brls.
Stearine—
Antwerp, 25 bgs.
,, 5 cs.
Sulphur—
Catania, 520 bgs. and a qty.
Saltpetre—
Hamburg, 4 cks.
Calcutta, 521 bgs.
Hamburg, 60 cks.
Salammoniac—
New York, 14 brls R. Crooks & Co.
Soapstone—
Genoa, 600 bgs. G. Huntriss & Co.
,, 200
Bordeaux, 100 sks. G. G. Blackwell
Tartaric Acid—
Rotterdam, 5 cks.
,, 20
Tartar—
Naples, 1 ck. R. Powles
,, 4
Bordeaux, 23
Ultramarine—
Rotterdam, 4 cks.
Verdigris—
Bordeaux, 1 ck.
Waste Salt—
Hamburg, 240 t.
,, 516 bgs.
Zinc Ashes—
New York, 18 brls. R. Crooks & Co.
Boston, 12
Zinc Oxide—
Rotterdam, 50 cks.
Antwerp, 95 brls.
Terneuzen, 125

HULL.

Week ending Sept. 18th.

Albumen—
Rouen, 2 cks. Rawson & Robinson
Acetic Acid—
Rotterdam, 1 cs. G. Lawson & Sons
Aluminium—
Antwerp, 31 cks. Bailey & Leetham
Acid *(otherwise undescribed)*
Rotterdam, 1 brl. G Lawson & Sons
Barytes—
Antwerp, 42 cks. H. F. Pudsey
Hamburg, 100 t. Wilson Sons & Co.
Antwerp, 100 bgs. Bailey & Leetham
Bremen, 23 cks. Tudor & Sons
,, 72
Caoutchouc—
Copenhagen, 1 brl. Wilson Sons & Co.
Cellulose—
Hamburg, 142 rolls C. M. Lofthouse & Co.
Chemicals *(otherwise undescribed)*
Dunkirk, 10 pks. Wilson Sons & Co
Antwerp, 25 ,,
Hamburg, 15 ,,
Bremen, 18 cks.
Dunkirk, 10 pks. Wilson Sons & Co.
Dyestuffs—
Alizarine
Rotterdam, 14 pks. W. & C. L. Ringrose
,, 22 Hutchinson & Co.
,, 2 brls G. Lawson & Sons
,, 5 cks. Hutchinson & Sons
,, 47 pks W. & C. L. Ringrose.
,, 13 cks. Hutchinson & Sons
Myrabolams
—— 67 bgs. Hutchinson & Son
Indigo
Amsterdam, 16 chts. W. & C. L. Ringrose
Argols
Bordeaux, 47 bgs. Rawson & Robinson
Dyestuffs *(otherwise undescribed)*
Antwerp, 6 cks. Wilson Sons & Co.
Glucose—
Hamburg, 100 bgs. A. C. Hornstedt & Co.
,, 10 cks.
Stettin, 25 cks. Wilson Sons & Co.
,, 1,200 bgs. C. M. Lofthouse & Co.
,, 200
,, 6 cks. Wilson Sons & Co.
,, 26
Glycerine—
Amsterdam, 12 pks.
Rotterdam, 5 crbys.
Gutta Percha—
Dunkirk, 1 cs. Wilson Sons & Co
Muriate—
Rotterdam, 19 cks. G. Lawson & Sons
Oxide—
Rouen, 4 cks. Rawson & Robinson
Pitch—
Archangel, 700 cks.
Hamburg, 59 brls. H. F. Pudsey
Stettin, 73 cks.
Potassium Sulphate—
Hamburg. 203 bgs. G. Lawson & Sons
Phosphate—
Montreal, 200 t.
Ghent, 253
Soda—
Rotterdam, 8 cks. G. Lawson & Sons
Tar—
Libau, 63 brls.
Turpentine—
Bordeaux, 25 brls. Rawson & Robinson
Libau, 50
Ultramarine—
Rotterdam, 2 cks. Storry, Smithson & Co

GLASGOW.

Week ending September 18th.

Borax—
Rouen, 10 cks.
Barytes—
Rotterdam, 23 cks.
Caustic Soda—
Antwerp, 80 drms.
Chrome Alum—
Rotterdam, 5 cks.
Chemicals *(otherwise undescribed)*
Antwerp, 7 cks.
,, 7021 pks.
Dyestuffs—
Logwood
Milk River, 387 t. W. Connal & Co.
,, 95 ,,
Madders
Marseilles, 3 brls. Robertson M'Intosh & Co.
Tanners' Bark
Oran, 250 t.
,, 63
Extracts
Antwerp, 1 ck.
Alizarine
—— 236 cks. J. Rankine & Sons
Rotterdam, 2 cs.
Glycerine—
Rouen, 3 cks. 5 cs.
Gutta Percha—
Rotterdam, 4 bkts.
Manganese—
Poti, 2308 t.
Nickel Ore—
Tchio, 209 t. 4 c.
,, 1,241 6
Potassium Muriate—
Hamburg, 230 t. Eglington Chemical Co.
Potash—
Rotterdam, 20 cks. J. Rankine & Son
Stearine—
Antwerp, 50 cs.
Tartar—
Bordeaux, 7 cks. J. & P. Hutchison
Ultramarine—
Antwerp, 30 cs.
Waste Salt—
Hamburg, 292 bgs. J. Poynton & Son, Ld.

GRIMSBY.

Week ending September 13th.

Albumen—
Hamburg, 5 cs.
Antwerp, 12 pks.
Dieppe, 10
Chemicals *(otherwise undescribed)*
Hamburg, 5 pks.
Glucose—
Hamburg, 45 pks.

TYNE.

Week ending September 17th.

Alum Earth—
Hamburg, 18 cks Tyne S.S. Co.
Copper Precipitate—
Huelva, 314 t. Scott Bros.
Pyrites—
Huelva, 1,116 t. Scott Bros.
Phosphate—
Antwerp, 205 t.
,, 215 Blaydon Manure Co.
Saltpetre—
Hamburg, 7 cks. Tyne S.S. Co.

GOOLE.

Week ending Sept. 10th.

Alum—
Rotterdam, 14 brls.
Antimony—
Boulogne, 2 cks.
Caoutchouc—
Boulogne, 10 cks.
Dyestuffs—
Alizarine
Rotterdam, 45 cks.
Madders
Rotterdam, 5 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 40 cks. 4 cs. 51 pks.
Glycerine—
Rotterdam, 2 drms.
Hamburg, 2 3 cs.
Glucose—
Hamburg, 690 bgs. 9 cks.
Dunkirk, 420
Muriate—
Rotterdam, 20 cks.
Potash—
Calais, 15 brls.
Dunkirk, 8 22 drs.
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 3 cks.
Soda—
Rotterdam, 40 brls.
Waste Salt—
Hamburg, 933 bgs 344 t.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Sept. 10th.

Albumen—
New York, 5 t. 2 c. £354
,, 5 2 354
Arsenic—
Napier, 17 c. £16
Wellington, 1 t. 10 23
New York, 8 15 168
Ammonium Carbonate—
Yokohama, 1 t. 10 c. £58
Adelaide, 15 12
Ammonium Sulphate—
Demerara, 5 t. 7 c. £64
Brimstone—
Demerara, 3 t. 9 c. £27
Cream of Tartar—
Dunedin, 1 t. £101
Auckland, 1 105
Melbourne, 1 10 c. 160
Caustic Soda—
Otago, 17 c. £52
Seville, 10 t. 3 110
Lyttelton, 15 156
Constantinople, 1 14 27
Carbolic Solid—
Rotterdam, 1 t. 5 c. £139
,, 9 19 913
Yokohama, 2 8 100
,, 50 cs. 255
Citric Acid—
Sydney, 10 kgs. £66
Malmo, 1 c. 7
Moscow, 11 87
Melbourne, 1 t. 5 190
Stettin, 1 7
Genoa, 1 10 210
Hamburg, 1 1 ck. 171
Clarifiants—
Bordeaux, 24 cks. £42
Copperas—
Rabat, 5 t. 3 c. £15
Copper Sulphate—
Melbourne, 20 kgs. £130
Coal Products—
Pitch
Calcutta, 51 rlts. £23
,, 48 22
Galatz, 20 cks. 6
,, 50 brls. 64
Helsingfors, 310 463
Danzig, bulk 300
Galatz, 50 blls. 14
Tar
Calcutta, 197 rlts. £110
Galatz, 100 45 cks. 23
Braila, 25 brls. 15
Sulina, 60
Helsingfors, 600 330
,, 500 269
Calcutta 362 rlts. 256
Hamburg, 11 brls. 5
Colombo, 60 36
Norrkoping, 1,161 690
Danzig, 500 250
Taganrog, 100 66
Coal Products—*continued.*
Bombay, 15 20
Galatz, 100 50
Gothenberg, 250 112
Benzole
Rotterdam, 57 drms. £844
Stockholm, 5 131
Calais, 20 cks. 383
Rotterdam, 24 137
,, 30 pns. 438
Naphthaline
Rotterdam, 696 bgs. £101
,, 247 125
Hamburg, 100 67
Rotterdam, 286 70
Anthracene
Rotterdam, 884 cks. £5,707
Naphtha
Sydney, 25 drms. £60
Melbourne, 25 27
Phenol
Hamburg, 1 ck. £2
Alizarine
Boston, 20 cks. £294

Coal Products—*continued.*

Green Oil

Gothenburg, 200 brls. £90

Carbolic Acid

Hamburg, 2 cks. £19
" 2 22
Stettin, 10 cs. 87

Chemicals *(otherwise undescribed)*

Sydney, 5 t. £200
Melbourne, 1 tank 103
Adelaide, 24 pks. 44

Guano—

Demerara, 5 t 6 c. £56

Hypophosphite of Lime—

Philadelphia, 12 c. £151

Hydro Carbon—

Antwerp, 32 drs. £155

Leather Waste—

Ghent, 41 t. £50

Manure—

Brest, 71 t. 7 c. £551
Rouen, 113 550
St. Lucia, 40 365
Antigua, 2 23
Barbadoes, 3 34
Danzig, 14 15 75
Havre, 25 90
Berbice, 15 155
Hamburg, 10 40
Stettin, 98 520

Oil Cake—

Dunkirk, 150 t. £725

Oxalic Acid—

Yokohama, 5 c. £10

Potassium Bichromate—

Hong Kong, 6 c. £10

Potassium Chlorate—

Hong Kong, 1 t. 5 c. £55

Potassium Bicarbonate—

Philadelphia, 17 c. £23

Phosphoric Acid—

Demerara, 2 t. 10 c. £44
" 15 247

Phosphorus—

Kobe, 2,500 lbs. £450

Sulphuric Acid—

Singapore, 1 t. 5 c. £14

Saltpetre—

Santos, 9 t. 16 c. £221
Rio de Janeiro, 1 12 36

Sheep Dip—

E. London, 1 t. 5 c. £70
Natal, 200 gls. 24
Algoa Bay, 6 t. 140
Natal, 5 280
Adelaide, 9 15 495
Natal, 50 cs. 140

Sulphur—

Calcutta, 5 t. 8 c. £31

Soda Ash—

Auckland, 10 t. 2 c. £68

Sodium Sulphate—

Ghent, 100 t. £100
" 50 50

Salammoniac—

Messina, 2 bls. £12

Tartaric Acid—

Melbourne, 10 c. £65
Auckland, 5 35
Melbourne, 45 kgs. 300
Brisbane, 5 cs. 35
Melbourne, 15 100

LIVERPOOL.

Week ending Sept. 13th.

Alkali—

Rotterdam, 20 chts.
Copenhagen, 6 cks.
Corfu, 3 cs.
Genoa, 11 cks.
St. Petersburg, 100

Alum—

Calcutta, 10 t. 17 c. £30
Aleppo, 2 16 14
Havana, 2 17 14
Barcelona, 8 2 51
Bilbao, 2 10
Stockholm, 15 12 48

Arsenic Acid—

New York, 21 t. 11 c. 3 q. £335

Ammonium Carbonate—

Venice, 1 t. 3 c. £32
Hamburg, 15 2 q. 28
Odessa, 2 66
Genoa, 1 10 49
Odessa, 2 74
Antwerp, 2 10 47
Havre, 1 8 47

Ammonium Sulphate—

New York, 151 t. 12 c. £1,712
" 75 17 822
Barcelona, 100 15 3 q. 1,253
Valencia, 101 4 1,230
Gr. Canary, 15 3 176
Rotterdam, 50 600
Bordeaux, 20 11 1 238
Hamburg, 50 4 1 580
New Fairwater, 20 t. 4 c. 3 q. 250
New York, 30 7 1 350

Acids *(otherwise undescribed)*

Rio de Janeiro, 15 crbys. £13

Ammonium Muriate—

Boston, 3 t. 6 c. £80
New York, 5 4 78

Bleaching Powder—

Ancona, 28 cks.
Antwerp, 30
Bombay, 5 cs.
Boston, 745
Chicago, 65 pks.
Ghent, 36
Hamburg, 55
Hong Kong, 50
Lisbon, 24 brls.
New York, 188
Rotterdam, 28
Boston, 210 169 tcs.
Genoa, 232
Hamburg, 78
Malaga, 10 brls.
Montreal, 47
New York, 364
Philadelphia, 255 dms.
San Sebastian, 20 cks.

Borate of Lime—

Hamburg, 50 t. £544

Bisulphate of Lime—

Calcutta, 7 t. 4 c. £45

Borax—

Cardenas, 5 c. £8
Oporto, 1 t. 1 c. 29
Montreal, 3 7 2 q. 95
Rotterdam, 7 8 1 207
Hamburg, 13 20
" 10 16
Antwerp, 2 18 1 98
Christiania, 1 10 1 42
Constantinople, 1 5 45
Iquique. 10 1 16

Brimstone—

New York, 1 t. £17

Baryta Chlorate—

Venice, 3 t. 15 c. £280

Caustic Potash—

New York, 1 t. 1 c. £23

Calcium Chloride—

New York, 5 t. £13
Calcutta, 2 5
Bangabore, 1 16 c. 2 q. 14

Carbolic Acid—

Savannah, 8 c. 3 q. £43
New Orleans, 4 1 23
New York, 3 t. 13 3 275
Constantinople, 2 6
Hamburg, 5 2 50
New York, 1 19 3 153
Kurrachee, 14 1 27
New York, 2 9 120
Rotterdam, 14 3 9

Caustic Soda—

Amsterdam, 20 dms. 3 kgs.
Ancona, 30
Antwerp, 18
Auckland, 7
Bahia, 30
Barcelona, 20
Batoum, 160
Bilbao, 50
Braila, 15
Chicago, 50 pks.
Constantinople, 52
Copenhagen, 10
Gothenburg, 70
Hamburg, 2 10 kgs.
Higo, 350
La Guayra, 20
Leghorn, 35
Madeira, 4
Malaga, 50
Malmo, 5
Melbourne, 54
Montreal, 10
New York, 860
Philadelphia, 245
Piræus, 15
Rio Grande do Sul, 25
Rotterdam, 10
Seville, 55 25 10 brls.
Tarragona, 15
Vera Cruz, 25
Victoria, 50
Vigo, 30

Caaustic Soda—*continued.*

Yokohama, 50 dms.
Alexandria, 40
Alicante, 25
Barcelona, 245 35 cks.
Boston, 300
Calcutta, 15 pks.
Cardenas, 14
Ceara, 10
Galatz, 15
Genoa, 156
Havana, 50
Leghorn, 47
Lisbon, 20
Malaga, 36
Montreal, 300 15 cks.
Naples, 16
New Orleans, 548
New York, 198
Odessa, 175
Oporto, 10
Philadelphia, 105
Rotterdam 18
S. Petersburg, 1,737
San Sebastian, 40
Santander, 6
Santos, 20
Seville, 588 48 cks.
Valencia, 57
Valparaiso, 170
Vera Cruz, 17
Yokohama, 175
Manila, 29
Sydney, 80

Copper Sulphate—

Sydney, 5 c. £5
Melbourne, 12 t. 10 230
Genoa, 30 1 q. 530
Lisbon, 2 2 37
Bordeaux, 19 18 2 350
Calcutta, 5 102
Bilbao, 20 342
Palermo, 14 6 2 248
Catania, 8 5 146
Christiania, 17 16
Constantinople, 17 16
Venice, 5 2 1 87
Genoa, 27 469
Mersyne, 9 9
Gothenburg, 2 1 3 36
Odessa, 10 2 173
Hamburg, 5 1 3 90
Naples, 5 1 85
Ancona, 12 16 233
Antwerp, 6 6 2 118
Barcelona, 5 1 3 101
Bari, 2 19 3 54
Batoum, 3 56
Genoa, 5 1 3 94
Hamburg, 10 180
Copenhagen, 2 38
Melbourne, 22 10 415
Victoria, 1 19
Montreal, 1 5 3 23
Odessa, 3 54
Venice, 5 3 93
Naples, 5 8 3 117
Santander, 3 3 57
Rotterdam, 10 1 3 186
Toronto, 4 12 2 90
St. Petersburg, 25 5 3 463

Copperas—

Calcutta, 14 t. 15 c. £28
Volo, 3 1 1 q. 6
Malta, 4 13 9
Montreal, 18 18 41
Smyrna, 6 8 2 14
Piræus, 2 14 2 6

Citric Acid—

Batoum, 4 c. £32

Chemicals *(otherwise undescribed)*

Vera Cruz, 7 c. £14
" 5 cks. 2 bgs. 17

Disinfectants—

Alexandria, 3 cs. £8

Epsom Salts—

Alexandria, 100 kgs.

Guano—

Tarragona, 19 t. 18 c. 2 q. £194

Gypsum—

New York, 10 t. 2 c. 3 q. £30
" 10 2 1 30

Glycerine—

Hamburg, 7 t. 15 c. £185

Iron Oxide—

Philadelphia, 9 t. 16 c. £165

Magnesia—

Antwerp, 4 cwts.
Havana, 10 cs. 1 ck.

Manure—

Galveston, 1 t. 2 c. 1 q. £33
Genoa, 29 11 214
Havre, 201 15 3 980
Las Palmas, 3 18

Potassium Bichromate—

Aleppo, 7 c. £12

Potassium Carbonate—

New York, 5 t. 10 c. £110

Potassium Chlorate—

Boston, 5 t. £233
Calcutta, 1 46
New York, 5 250
Carril, 12 c. 30
San Juan, 1 10 75
Bilbao, 1 45
New York, 12 10 564
Oporto, 10 23
Boston, 10 467
Chicago, 10 23
Genoa, 3 6 142
Hamburg, 6 17 323
St. Petersburg, 5 10 220
Hiogo, 17 10 817
Santos, 2 93
Sydney, 10 409
New York, 5 233

Pitch—

Malta, 25 pks.

Phosphorus—

Shanghai, 10 c. £69

Potassium Prussiate—

Genoa, 1 t. £85

Sodium Nitrate—

Almeria, 3 t. 3 c. 1 q. £25

Soap—

Addah, 20 bxs.
Alexandria, 20
Antwerp, 400 cs.
Banoka, 20
Barbadoes, 1,100
Bathurst, 20
Belize, 400
Benin, 700
Bombay, 1
Calcutta, 38
Callao, 23
Cameroons, 100
Cape Coast, 100
Cape Town, 1,400
Carthagena, 25
Christiania, 20 pks. 205 50
Durban, 500
Ferrol, 50
Genoa, 75
Gibraltar, 5 670
Hong Kong, 200 dms. 100 10
Kingston, 100
Las Palmas, 300
Lauzarotte, 16
Malta, 30
Mpongue, 20
New York, 7 pks. 500
Port Natal, 1,325 6 bdls.
Quilimane, 206
St. Lucia, 115
Saltpond, 50
Teneriffe, 665
Trieste, 2 cs.
Trinidad, 1,050
Valparaiso, 2
Warre, 200
Calcutta, 25
Alexandria, 1
La Guayra, 4
Para, 1

Sodium Bicarbonate—

Antwerp, 10 cks.
Boston, 25 kgs.
Calcutta, 850
Catania, 60
Halifax, 25
Hiogo, 125
Montreal, 399
Nagasaki, 300
Odessa, 295
Rotterdam, 25
Trieste, 170
Yokohama, 2,125
Palermo, 20
Trinidad, 24

Sodium Silicate—

Bilbao, 4 cks.
Genoa, 17 brls.
La Guayra, 10
Montreal, 10
Oporto, 33
Piræus, 10
Seville, 50

Soda Ash—

Barcelona, 85 brls.
Boston, 104 cks.
Buffalo, 60
Ghent, 42
Lisbon, 77
Madeira, 4 40
Melbourne,
Milwaukee, 69
Montreal, 14

Soda Ash—*Continued.*
New York, 313 tcs. 38 cks.
Piræus, 10 brls.
Portland, 40
Puerto Cabello, 82
Rio de Janeiro, 75
Salonica, 35
Smyrna, 50
Sydney, 66
Toronto, 76
Baltimore, 477 417
Boston, 118 375 1,500 bgs.
B. Ayres, 200 brls.
Calcutta, 7
Leghorn, 15
M. Video, 168
New Orleans, 107
New York, 1,450
Oporto, 15 5
Philadelphia, 804 71
Rio de Janeiro, 70
San Francisco, 198
San Sebastian, 2
Santos, 10
Smyrna, 250
Venice, 16
Yokohama, 129

Soda Crystals—
Boston, 140 brls.
Montreal, 67
Salonica, 30
Alexandria, 20
Baltimore, 150 cks.
Calcutta, 850 kgs.
New Orleans, 100
New York, 50
Philadelphia, 747 610
Roustchouck, 10
St. John's, Nfld., 110
Smyrna, 100

Salt—
Antwerp, 285 t.
Benin, 11
Boston, 70
Ghent, 185
Grand Bassa, 10
Iceland, 70
Montreal, 78
Port Natal, 68
Rio de Janeiro, 1 1 c.
Wyburg, 420
Antwerp, 100
Baltimore, 1,090
Boston, 415
B. Ayres, 24
Calcutta, 2,659
Galveston, 500
Montreal, 382
Old Calabar, 40
Opobo, 45½
Para, 17 17
Philadelphia, 845
Porsgrund, 250
Rangers, 40
Rio de Janeiro, 8 c.
Rosario, 5 12
Rotterdam, 427
Sandheads, 3,138
Shediac, 300
Sierra Leone, 400
Toronto, 22 14

Sodium Carbonate—
Boston, 56 brls.
Mossamedes, 1 cs.

Sodium Chlorate—
New York, 2 t. 10 c. £142
Hamburg, 10 28
,, 1 55

Salt Cake—
Baltimore, 95 t. 5 c. £233

Strontia—
Rotterdam, 20 t. 8 c. £257

Salammoniac—
Boston, 5 t. £170
Calcutta, 1 12 c. 56
Patras, 7 12
Bordeaux, 6 11
Smyrna, 10 35
Shanghai, 10 3 q. 20

Saltpetre—
Halifax, 5 c. 2 q. £6
Ensenada, 20 t. 8 366
Para, 1 23
Maceio, 18 3 20
Santos, 2 14 3 60
Maceio, 2 43
Carthagena, 19 7 3 366

Sulphur—
Cardenas. 1 t. 10 c. £9
Boston, 25 1 106
Madras, 1 7
New York, 79 7 357

Superphosphate—
New Orleans, 1,602 t. 4 c. 3 q. £4,005
Valencia, 90 9 3 226
Gr. Canary, 15 37

Sheep Wash—
Colon, 13 c. £28
Kurrachee, 1 t. 13 39. 60
E. London, 2 10 107
Charlottetown, 2 cks. 9
Rangoon, 125 drs. 25

Tartars—
New York, 25 t. £2375

Tar—
Honolulu, 40 brls.
Rouen, 63½ t.

Tin Crystals—
Trinidad, 10 c. 2 q. £36

Tartaric Acid—
Vera Cruz, 1 c. £5

Zinc Chlorate—
Bombay, 1 t. 10 c. £20
Amsterdam, 9 60
Bombay, 2 10 2 q. 42

Zinc Sulphate—
Hamburg, 4 t. 17 c. 1 q. £75

Zinc Muriate—
Bombay, 5 t. 18 c. £100

TYNE.

Week ending September 17th.

Arsenic—
Venice, 18 t. 12 c.

Ammonium Sulphate—
Hamburg, 20 t.

Alum—
Christiania, 5 c.

Anthracene—
Rotterdam, 52 t. 12 c.

Antimony—
Copenhagen, 1 t. 7 c.
Hamburg, 1
New York, 48
Rotterdam, 2

Alkali—
Venice, 4 t. 8 c.
Antwerp, 1 11
Gothenburg, 5 4
Leghorn, 8 3

Barytes—
Rotterdam, 2 t. 13 c.

Bleaching Powder—
Copenhagen, 10 t. 14 c.
Dunkirk, 28 8
Drontheim, 10 5
Gothenburg, 16 4
Hamburg, 35 15
,, 22 14
,, 33 6
Rotterdam, 8 9
,, 66 2
Antwerp, 24 3
Christiania, 49 13
Ghent, 2 18
Malmo. 14
Rotterdam, 13 6
Libau, 25 7

Blanc Fixe—
Dunkirk, 5 t. 5 c.
Copenhagen, 2 9
,, 2 8
Genoa, 10

Barytes Carbonate—
Libau, 10 t. 6 c.

Copperas—
Christiania, 5 t.

Calcined Magnesia—
Genoa, 1 t. 5 c.

Caustic Soda—
Copenhagen 1 t. 15 c.
Gothenburg, 10 3
New York, 200 t. 4 c.
Genoa, 24 13

Epsom Salts—
Antwerp, 2 t.

Gypsum—
New York, 91 t. 5 c.

Litharge—
Hamburg, 1 t. 2 c.
Oporto, 1 3
Gothenburg, 2

Magnesia—
Hamburg, 2 c.
Antwerp, 2 q.

Potassium Bichromate—
Rotterdam, 2 t. 13 c.

Potassium Chlorate—
Antwerp, 1 t. 2 c.
Rotterdam, 1

Soda Crystals—
Rotterdam, 2 t. 3 c.

Sulphur—
Hamburg, 10
Rotterdam, 10

Sodium Chlorate—
Rotterdam, 1 t. 2 c.

Soda—
Venice, 16 t. 8 c.
Copenhagen, 40 17
,, 1 18
Hamburg, 18 13
,, 3 4
Malmo, 16 3
Aarhuus, 31 7
Odense, 8 3
Antwerp, 3
,, 3 11
Leghorn, 1 17

Soda Ash—
Venice, 30 t. 16 c.
Libau, 20 7
,, 20 7
Odense, 3 17
Gothenburg, 39 19
Hamburg, 4
,, 10
New York, 49 8

Sodium Sulphate—
Copenhagen, 51 t. 8 c.
Rotamka, 31 4

Sodium Hyposulphite—
Antwerp, 1 t.

Sodium Bicarbonate—
Odense, 4 t. 6 c.

Salt—
Esbjerg, 5 t.

GLASGOW.

Week ending September 18th.

Acetate of Lime—
Antwerp, 9 t. 13¾ c. £114

Ammonium Carbonate—
Bergen, 20 kgs. £40

Ammonium Sulphate—
Barcelona, 122 t. 8¾ c. £1,370
Demerara, 1,036 599

Benzole—
Rotterdam, 8 drms.

Caustic Soda—
New York, 197½ c. £55

Chemicals (*otherwise undescribed*)
Rangoon, 4 t. 14 c. £36

Dyestuffs—
Logwood
Quebec, 204¾ c. £77
Extracts
Quebec, 71¼ c. £104
,, 16 37

Epsom Salts—
Christiania, 50 bgs. £20

Manganese Oxide—
New York, 206¼ c. £96

Paraffin Wax—
Barcelona, 5 t. 2½ c. £180
Japan, 24 5 770
,, 10,916 lbs. 176
Italy, 28½ 50
Nantes, 3 2 85

Potassium Bichromate—
Quebec, 83 c. £144
Antwerp, 31 t. 4 853
Barcelona, 21 7½ 661
Gothenburg, 5 6 155
Bergen, 1 ck. 7
Christiania, 1 8
Rotterdam, 52 832
Italy, 32¼ c. 60
Antwerp, 32 14 880
Rotterdam, 9 cks. 135

Potassium Prussiate—
Christiania, 1 ck. £5

Sulphuric Acid—
Rangoon, 12 t. 1 c. £130

Soda Ash—
Baltimore, 294½ c. £92

Sodium Bichromate—
Amsterdam, 2 cks. £12
Quebec, 62 c. 79
Amsterdam, 2 cks. £13

Sulphur—
Trinidad, £65

Stannous Chloride—
Trinidad, £64

Salt—
Trinidad, 40 t. 6¼ c.

Tar—
Madras, 25½ t. £66

GRIMSBY.

Week ending Sept. 13th.

Coal Products—
Dieppe, 78 cks.

Chemicals (*otherwise undescribed*)
Dieppe, 1 cs. 80 pks.

HULL.

Week ending Sept. 16th.

Alkali—
Libau, 20 cks.

Bone Size—
Rotterdam, 2 cks.

Bleaching Powder—
Drontheim, 31 cks.
Gothenburg, 11

Caustic Soda—
Bergen, 2 drms.
Christiania, 20
Dunkirk, 30 cks.
Danzig, 235
Hamburg, 1
Konigsberg, 34
Libau, 17

Chemicals (*otherwise undescribed*)
Antwerp, 64 cs. 28 cks. 7 pks.
Bremen, 2
Bergen, 1 30
Boston, 50
Christiania, 5 39 162 slbs.
Dunkirk, 7
Danzig, 2 254
Gothenburg, 14 68 16
Hamburg, 66 219 1
Libau, 8 100
New York, 100
St. Petersburg, 10
Rotterdam, 34 16
Stockholm, 10
Copenhagen, 147
Stettin, 40

Dyestuffs (*otherwise undescribed*)
Antwerp, 1 drm.
Boston, 14 cks.
Christiania, 6 crbys.
Hamburg, 2 1 cs.
Rouen, 1
Rotterdam, 2 kgs. 22 4
Stettin 90 bgs.

Ferro Manganese—
Gothenburg, 15 cks.

Manure—
Dunkirk, 5 t.
New York, 250 bgs.

Pitch—
Antwerp, 244 t.

Tar—
Antwerp, 1 cs. 2 cks.
Gothenburg, 100
Hamburg, 5
Stockholm, 15
Stettin, 1

Turpentine—
Antwer3, 1 ck-
Stettin, 15

GOOLE.

Week ending Sept. 10th.

Benzole—
Ghent, 16 drms.
Rotterdam, 33 cks.

Bleaching Preparations—
Rotterdam, 42 cks.

Coal Products—
Antwerp, 50 cks.
Ghent, 20 drms.
Rotterdam, 52

Copper Precipitate—
Rotterdam, 252 cks.

Chemicals (*otherwise undescribed*)
Antwerp, 36 drms
Ghent, 10 cks.
Hamburg, 64

Dyestuffs (*otherwise undescribed*)
Boulogne, 2 drms. 2 cks. 2 cs.
Ghent, 13 1
Rouen, 2

Manure—
Boulogne, 158 bgs.
Dunkirk, 251

PRICES CURRENT. WEDNESDAY, SEPTEMBER 24, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	62/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	1	0
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	4	6
,, (free from arsenic, 140/145°) .. .. ,,	1	7	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	8	9
Aniline Oil (pure) .. .. per lb.	0	0	11½
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	7	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	1½
,, 50/90 ,, ... ,,	0	3	1½
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¾
,, (crude 60°) .. .. per gallon	0	1	8½
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	61	0	0
,, Sulphate .. .. ,,	19	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	0	0
,, Litharge Flake (ex ship) .. .. ,,	15	10	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	5	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	4½
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	26	0	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	9¾
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	5½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	5	17	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	15	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	15	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	12	6
,, ,, (60 % Caustic Soda, cream) (f.o b.) ,,	9	10	0
,, Bicarbonate .. .. ,,	6	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	7	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	102	0	0
,, Crystals .. .. per lb.	0	0	6⅞
Zinc (Spelter) .. .. per ton.	25	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	7	6

THE

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PAPER-MAKERS AND THE CHEMICAL UNION.

THE success of the Chemical Union having now become well-nigh assured, and the paper-maker, assisted by the daily press, having done his level best to thwart the combination, a calm succeeds the storm, which all parties may utilise with profit in dispassionately considering the present position, as compared with the *status quo ante*.

Some week or two ago, it was gravely announced that many of the leading paper-makers were about to start a manufacturing concern to make their own caustic soda and bleaching powder. The capital was modestly fixed at a million sterling, but it was not stated how much of this would be found by the enterprising paper-makers, and how much would be placed in the confiding arms of the British public.

The opponents to the formation of a Chemical Union, and notably the daily newspapers, seem to have had no idea of how they were giving the lie direct to their own utterences by issuing the foregoing statements. The daily press has been endeavouring to persuade the public that the existing alkali plant is obsolete and well-nigh worn out. Now as a matter of fact, the only process by which caustic soda can be economically manufactured at the present time is the Leblanc process, so that if the leading paper-makers erect a works to make caustic soda, it must be by the Leblanc process, so much vilified and abused during the past few weeks.

Of course it goes without saying, that paper-makers will, during the continuance of the Union, have to pay more for their chemicals than they have been in the habit of doing. When bleach was selling at four guineas per ton, the alkali-maker was bearing the loss, while the paper-maker reaped the profit; the alkali-maker now thinks it is high time to stop selling his goods below cost price, and we agree with him entirely. It would be much more to the credit of the paper-trade, if greater efforts were made towards economy, by using their utmost endeavours to keep their soda liquors out of our rivers and streams, and we venture to assert that the proprietors of paper mills would get a much better return for their money by recovering the soda from their waste lyes, than by spending it in a co-operative chemical works.

One hundred and fifty thousand tons of bleach per annum is about the maximum quantity that can be sold by English houses; there is sufficient plant in existence to make this as a minimum production. If paper-makers manufacture their own chemicals, there will be nothing left for the alkali-maker, but to use his pyrites burners and leaden towers for the manufacture of paper stock, or paper itself, by means of the sulphite process, and so hasten the day of cheaper paper, which, no doubt, will put the daily press once more in an Elysian mood.

NOTES ON THE VULCANIZATION AND DECAY OF INDIA RUBBER.

[By William Thomson, F.R.S.E., F.C.S.]

(Read before section B of the British Association at Leeds.)

UNDER ordinary conditions india-rubber for vulcanizing is usually mixed with sulphur and heated to a high temperature, when chemical combination takes place between the sulphur and the rubber producing a much more valuable compound for ordinary purposes than unvulcanized rubber; the former remaining soft at very low temperatures and firm at high temperatures, whilst the latter becomes hard and quite plastic respectively at those temperatures.

In making cloth for waterproof garments, another method is employed for vulcanizing the rubber, viz., by wetting its surface with a mixture of somewhere about five to ten parts of chloride of sulphur dissolved in 100 parts of bisulphide of carbon, and then heating the fabric gently to evaporate away the excess of these substances; the rubber covered cloth cannot be heated to a high temperature like the rubber alone, because the heat would be liable to injure the cotton, silk, or wool of the fabric, or destroy or injure the colours.

The bisulphide of carbon softens and penetrates the fine layer of rubber, carrying with it the chloride of sulphur dissolved in it, and it is generally supposed that the chloride of sulphur breaks up, the sulphur combining with the rubber producing vulcanization, and the chlorine combining with the hydrogen producing hydrochloric acid which is liberated. This reaction is clearly not the correct one, and it is probable that the reverse is more in accordance with the facts, viz., that the chlorine of the sulphur chloride combines with the rubber producing vulcanization, leaving the sulphur in the free state, or only partially in combination with the rubber, because in rubber vulcanized by the cold process I have found free sulphur to be present.

From a piece of rubber covered cloth I separated the rubber, and submitted it to analysis, by mixing it thoroughly in small pieces with pure sodium carbonate and igniting, then dissolving the whole in water and adding to it peroxide of hydrogen previously treated with excess of barium chloride (to separate sulphuric acid or sulphates). The peroxide ensures the conversion of the lower oxides of sulphur into sulphuric acid, whilst the excess of barium chlorides precipitates the sulphuric acid in the solution which is then weighed as barium sulphate.

Another portion of the made up solution was neutralized, and the chlorine present titrated. The rubber previous to ignition, as above described, had been well boiled in water and dried to separate any hydrochloric acid which might be present, but only a faint trace of chlorine compound could be thus separated from the rubber.

The total sulphur present in the rubber amounted to 2·60, and the total chlorine to 6·31 per cent.

The yellow coloured sulphur protochloride is best adapted for vulcanizing, because it does not act too strongly upon the rubber, whilst the dark coloured chloride of sulphur, containing as it does a large quantity of the higher chlorides of sulphur, is liable to render the rubber quite hard by vulcanizing it too much. The theory generally adopted to explain this is, that these higher chlorides break up easily, liberating their sulphur which thus combines in greater quantity with the rubber; but my experiments and analyses prove that it is chiefly the chlorine and not the sulphur of the chloride of sulphur which produces the vulcanization.

A rubber substitute, much used at present, is produced by acting on vegetable oils, such as rape, linseed, etc., with a mixture of chloride of sulphur and bisulphide of carbon; the oil becomes converted into a solid substance resembling india-rubber to some extent, but being much more brittle. This body is now used in large quantity for mixing with india-rubber for the purpose of cheapening its production. On analysis of some samples of this material I have invariably found tnat it contained a much greater proportion of chlorine than of sulphur, and this process therefore is a vulcanization by chlorine rather than by sulphur.

Recently I analysed three samples of rubber substitute, the one termed "special" another "spongy" india-rubber substitute, the third being similar to the first in appearance. The first contained of sulphur 3·4 and of chlorine 7·6 per cent.; the second contained of sulphur 4·56 and of chlorine 8·22, and the third 2·67 of sulphur and 7·90 of chlorine per cent.

These rubber substitutes contain considerable quantities of oily matters soluble in ether which I have also found to be chlorine and sulphur compounds of the oils. The first yielded 20·0 per cent., the second 14·3 and the third 11·5 per cent. of these thick oily matters soluble in ether. This oily substance from the first sample contained 2·6 per cent. of sulphur and 6·1 per cent. of chlorine, whilst that from the second contained 2·97 and 6·87 per cent of sulphur and chlorine respectively.

Some rubber manufacturers regard this oily matter as injurious to the rubber, and reject any substitute which contains any considerable proportion of it. I have found, however, by experiment that this oily compound instead of acting injuriously on india-rubber, actually acts as a preservative of it; some rubber threads were smeared with this oily extract, some with ordinary (unvulcanized) rape oil and some left untreated; these were put into an incubator at 150° Fahrenheit for a few days when it was found that the oil treated rubber was quite soft and rotten, whilst the other two had remained sound, after a few days more, the original rubber threads had become quite rotten, whilst the threads smeared with the oily part of the vulcanized oil remained quite sound.

The first and second samples of rubber substitute were examined for soluble chlorides or hydrochloric acid, by boiling in water, the first gave 0·18 per cent of chlorine soluble in water, and the second 0·05 per cent.

It has been known for some time that copper salts exert a most injurious influence on india-rubber, copper salts are sometimes used in dyeing cloth, which are afterwards employed for water proofing with india-rubber, and it seems quite astonishing what a small quantity of copper is required to harden and destroy the rubber, and the destructive effect of copper is further enhanced if the cloth contains oily matters in which the copper has dissolved.

As an example, here is a piece of cloth, alleged to have damaged the thin coating of india-rubber on it: I found it to contain copper, and with a view of demonstrating this point, I took one piece in its original condition, to the end of this I pasted a similar piece of the cloth from which the oily and greasy matters had been removed by ether, and to the end of this again, I pasted another piece of the same cloth, from which I had removed both oily and greasy matters and copper; these three pieces joined end to end into one, were then coated in the usual way with india-rubber, and then hung in an incubator at 150° Fah. In the course of a few days, the rubber on the original cloth had become soft, and it then hardened and became rotten and useless; the second piece from which the greasy matters had been removed, then became quite hard and rotten, whilst the part from which both greasy matters and copper had been removed has remained in a perfectly elastic and good condition.

Professor Dewar observed accidentally, that metallic copper when heated to the temperature of boiling water in contact with the rubber exerted a destructive effect upon it. With a view of finding whether this was due to the copper *per se*, or to its power of conducting heat more rapidly to the rubber, I laid a sheet of rubber on a plate of glass, and on it placed four clean discs, one of copper, one of platinum, one of zinc, and one of silver. After a few days in an incubator at 150° Fah., the rubber under the copper had become quite hard, that under the platinum had become slightly affected and hardened at different parts, whilst the rubber under the silver and under the zinc remained quite sound and elastic. This would infer that the pure metallic copper had exerted a great oxidising effect on the rubber, the platinum had exerted a slight effect, whilst the zinc and silver respectively had had no injurious influence on it. A still more curious result was this, that the rubber thus hardened by the copper contained no appreciable trace of copper, the copper therefore presumably sets up the oxidising action in the rubber without itself permeating it. I have pleasure in acknowledging the assistance rendered to me in this investigation of my assistant, Mr. Frederick Lewis.

A NEW OIL-BURNING DEVICE.

A ROCHESTER, N. Y., mechanic, John Burns by name, has perfected an invention which promises to be of great value wherever oil is used for fuel purposes, inasmuch as it dissipates all risk of accident from explosion or fire. Mr. Burns' idea is simplicity itself. Where oil fuel is used under boilers, or in fact anywhere else, he proposes to prevent the generation of inflammable gases, or the risk of the flame communicating with the supply by forcing the oil through a pipe containing water, the lightness of the oil, of course, bringing it to the top. His plan as given is to fill a pipe with water. At the end where the burner is located is a valve and behind it and above the water pipe, a feed pipe which contains oil, but is directly attached to the water pipe. At the other end of the pipe is the receptacle holding the oil. The oil meets the water a few feet from the receptacle holding the former. Then the valve or the burner which regulates the supply of oil is opened. The oil at the valve starts drop by drop; while at the other end it goes drop by drop through the pipe containing the water. Fire cannot force the oil or flame back through the water pipe, and therefore an explosion of the great body of oil in the feed tank cannot result, the oil tank can be placed as far away from a building as desired, or may be buried underground. It is not necessary to have more than a pint of oil actually on the premises to run a large boiler, and this will be forced drop by drop through the water pipe. A successful trial of the invention has been made, and a company with 500,000 dols. capital incorporated under the laws of the state of Vermont to introduce it.—*American Manufacturer.*

ARTIFICIAL SILK.

MR. VIVIER'S new method of making silk out of cotton or wood cellulose, which, it is thought, bids fair to rival the already well known process of M. Chardonnet, is described at length in the columns of *La Revue Industrielle*. The material is obtained by heating tri-nitro cellulose, obtained by alkalisation and nitrification of cotton, with a mixture of acetic acid and gelatine, or other equivalent re-agents. This material is transformed into pure filaments, which are a little less tenacious than natural silk, but quite as lustrous, and cost, according to the inventor, about sixty-eight cents per kilogramme, or about thirty-two cents per pound of yarn. The first part of the process consists in the economical and rapid manufacture of pyroligneous acid, from which is then easily extracted the crystallisable acetic acid necessary for the elaboration of the filaments. The succeeding processes are three in number:—(1) The preparation of the tri-nitro-cellulose; (2) its treatment by acetic acid; (3) its treatment by the re-agents which convert it into silk, or, to be more exact, into a silky material, which must then be transformed into silk again. Taking these processes in their order we have:—

(1) THE PREPARATION OF THE TRI-NITRO-CELLULOSE.

This comprises two operations, alkalisation and nitrification. The alkalisation of the cotton is effected by treating it with an ammoniacal solution of caustic soda. For this purpose, four kilogrammes of caustic soda are dissolved in twenty litres of water, and to this solution, after it has cooled, are added ten litres of commercial ammonia at twenty-two degrees Be. One kilogramme of cotton is steeped in this solution of ammoniacal soda for three days and three nights, and stirred once a day. The cotton is then pressed and washed in water up to complete neutrality. It is next carded, after drying, in order to open the fibres so as to prepare it for nitrification. Nitrification is effected in an apparatus with a capacity of about 120 litres. This apparatus is charged with about twenty kilogrammes of saltpetre, dryed at 45°, on which are poured, at two or three times, thirty kilogrammes of pure sulphuric acid at 66° Be., the mass being stirred until the ingredients are thoroughly mixed. It should then have a temperature of 85°. Into this liquid, at this temperature, tufts of cotton are introduced in small quantities. The apparatus is closed and made to revolve, with a double revolution, round its horizontal axis, and round its vertical axis, for five or six minutes. Then it is stopped, the lid is lifted, and the material dropped into a tub of water. After washing and drying in an oven, the nitrated cotton is ready to be used for the preparation of silk.

(2) THE TREATMENT BY ACETIC ACID.

Three solutions are prepared:—(*a*) A solution of gutta-percha in sulphide of carbon; (*b*) a solution of isinglass in glacial acetic acid; (*c*) a solution of tri-nitrated cotton in acetic acid. These solutions are mixed cold, so as to obtain a final solution in which the pyroxiline or tri-nitrated cotton forms seventy per cent., the isinglass twenty per cent., and the gutta-percha ten per cent. To this is added a very small quantity of glycerine or castor oil, and the whole is blended together in a mixing apparatus. After this mixing process, the material is twice filtered, first roughly, and then more delicately.

(3) ITS TREATMENT BY RE-AGENTS, WHICH CONVERT IT INTO SILK.

There has been obtained, by the preceding methods, a semi-fluid viscous substance, which is made into a filament, under water, by driving it through a small orifice. The thread thus produced, passes, with the aid of appropriate machinery, through the following described six chemical baths:—

(*a*) A bath of soda to remove the excess of acetic acid.
(*b*) An albuminous bath (of three per 1,000), to make the fibre supple.
(*c*) A bath of bi-chloride of mercury (twenty-five per 100), to coagulate the fibres. The coagulation is accelerated by passing the material, afterwards, through an atmosphere of carbonic acid.
(*d*) A ten per cent. solution of ammonia.
(*e*) A bath of sulphate of alumina, which impregnates the fibres with a deposit of alumina. These last two baths are intended to lessen the combustibility.
(*f*) A second bath of albumen (three per 1,000) to render the fibre supple.

The proportions can be varied to a certain extent, or even replaced by equivalents, according to the particular results which it is desired to obtain. The filament which remains, after this series of chemical processes, is now wound upon a drum, before which a carriage is made to travel by means of a worm. This carriage is provided with burnishers, which polish the thread, and with guides, which ensure its regular arrangement on the drum. When the drum and its fibre have been dried in a stove, the latter is carried to the winding machine. The bobbins of fibre thus obtained are next carried to the twisting machine, where the yarn is formed by twisting together a number of filaments sufficient to constitute a thread. The filaments on the bobbins, which are reeled as they turn round their common axis, are twisted into one single thread, before reaching the drawer, which takes the thread to the reel. The shafts are hollow, so that if desired, a liquid jet can be projected on the thread as it is forming.

In connection with the above a short account of the way in which another distinguished inventor, M. Frémy, proposes to meet the very grave difficulty connected with the use of all silk of this kind, namely, its tendency to blaze up like gun-cotton, owing to the presence of the nitric compound, combined with the cellulose, is also interesting. This nitric compound is eliminated by M. Frémy in the following manner:—The vegetable silk is treated cold with a dilute solution of the sulphohydrate of ammonia. The nitric element in the tissue is thus rendered soluble in water, and is entirely absorbed by the sulphurous compound. The fibrous cellulose principle remains in the insoluble state, and can be purified simply by washing in cold water. This action of the sulpho hydrate of ammonia on vegetable silk is so rapid that it is complete in a few hours, and so thorough that the resultant fibre does not burn more quickly than threads of cotton. The denitrated silk preserves all its original properties. It is tenacious, it is as glossy as the purest silk in the market, and it is not more inflammable than cotton yarn.

FIXING TANNIN.

THE use of tartar emetic for fixing tannic acid in mordanting cotton which is to be dyed with the basic aniline colouring matters is so universal, that dyers often forget that there are other metallic salts, such as the acetates of tin, zinc, alumina, and iron, the chlorides of tin, and oxalate of antimony, which are equally serviceable. There is a little difference in the tint of the tannined cotton after it has been fixed in these various salts; with tartar emetic, oxalate of antimony, and other antimony preparations, the fibre has a light chamois colour, with zinc salts a brownish yellow, with acetate of alumina a faint grey, with tin white or very faintly yellow, and with iron various shades of blue grey.

Tannin itself does not properly fix these colours on the fibre, and when it is used alone there is a loss of colouring matter, as some of the tannin is dissolved off the fibre when in the dye-bath, and this throws down some of the colouring matter as a precipitate. Further, the colour fixed on the fibre is neither so bright nor so fast to washing and soaping as when the tannin is properly fixed on the fibre by a fixing agent before dyeing.

As a rule, the cotton, after passing through the tannin bath, is simply wrung and then entered into the fixing bath; which is not the best although it is the quickest system to pursue. The cotton should be dried before, and then the tannin is fixed on the fibre before any of it has had time to become washed off, whereas when it is passed direct into the fixing bath some of the tannin comes off the fibre, and entering into the fixing bath forms, with the fixing agent, an insoluble precipitate, and thus a dirty, cloudy bath results, which is not desirable, especially as some of this precipitate may get on to the fibre in a very loose form, and lead to giving coloured fabrics that rub badly.

When the tannin cotton is dried first, a cleaner fixing bath is obtained, which can be used longer and its contents more completely absorbed. It must be borne in mind that the various mordanting and dyeing baths are not completely exhausted of their valuable contents; if these baths be kept as simple in composition as possible and every care be taken to prevent undue soiling, they can be retained in use by keeping their strength up by additions of small quantities of concentrated liquor as may be required. In this way dyeing can be done in a much more economical manner than is always possible with the methods at present in vogue.

Of the mordants named above, acetate of zinc gives the cleanest baths, then follow oxalate of antimony, tartar emetic, tin chloride, alumina, and iron. Iron mordants, owing to their giving dark shades, are not useful in dyeing with the basic aniline colours, as they have too great an influence on the shade of the dyed fabrics, blues being made darker, reds turned into maroons, and so on. In some cases this property may be rendered very useful, as in dyeing a maroon with magenta, a chocolate with Bismarck brown, a mode with auramine, etc. Dyers do not avail themselves of this as much as they might. For violet, saffranine, and methylene blue, tin chloride forms the best fixing agent, and gives the brightest shades. Next follow tartar emetic and oxalate of antimony. Zinc acetate produces yellower shades with these colouring matters than the other fixing agents, and it has a similar yellow effect on malachite green; for this colouring matter antimony oxalate or tartar emetic forms the best fixing agent. For auramine acetate of zinc will be found to give good results.

PERMANENT CHEMICAL EXHIBITION.

THE proprietors wish to remind subscribers and their friends generally that there is no charge for admission to the Exhibition. Visitors are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., London. — Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool. — Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Northwich. — Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Buckley.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

Chadderton Iron Works Co, Chadderton—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co, Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne. — Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant —Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester. — Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, Plaistow, Essex. — Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

Galloways, Limited, Manchester. — Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co., Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters.

Joseph Kerthaw and Co, Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet. Makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co, Manchester. — Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Meldrum Bros., Manchester. — Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooke, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.— Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

COMMERCIAL FERTILIZERS.

REPORT OF KENTUCKY AGRICULTURAL EXPERIMENT STATION.

PHOSPHORIC acid.—Next in importance to nitrogen as a plant food comes phosphoric acid. This acid usually combines in the soil with lime magnesia, and iron. In these forms it is insoluble in water, so that practically there is no loss by drainage. The source of loss is that carried off by the crops. The loss can be supplied only by the use of fertilizers. Phosphate of lime is the general source of phosphoric acid in fertilizers. There are many sources from which the phosphoric acid is obtained for commercial fertilizers such as:

1. Bone meal.
2. Bone ash.
3. Bone black.
4. Superphosphate of lime, or acid phosphate.
5. Phosphate rock.
6. Thomas slag and guano.

1. Bone meal.—Bone meal is valuable not only for the phosphoric acid which it contains, but also for its nitrogen. Bones are composed of two distinct substances which interpenetrate one another. There is, as it were, a skeleton of earthy matter, which is called phosphate of lime or bone phosphate, and a flesh of organic matter, which is called ossein. Ossein is a highly nitrogenized substance.

The fineness to which bones are ground is an important consideration as to their value. The finer the meal, so much more readily will it putrify and dissolve in the soil, and so much sooner will the crops be fed. There is some difficulty in grinding fresh raw bones. To obviate this difficulty they are generally steamed, or carried through some process whereby the fat is extracted. Steamed or dessicated bones, if not very strongly steamed, are better for fertilizers than raw bones. This is contrary to the general belief, but raw bones contain the fat, which is not only useless to the plant, but adds weight and clogs the meal, and hinders decomposition of the bone in the soil. Of course the steaming process must not be carried on to such an extent as to extract the nitrogenous portion of the bone. It is true that some of the nitrogen is lost, nevertheless the meal from steamed bone has proved itself to be better than from ordinary raw bone.

Bone ash is sometimes used as a fertilizer. It is generally used to make other forms of phosphates, such as superphosphates.

2. Bone black.—The spent black from sugar refineries is sold to manufacturers of fertilizers. When bones are heated in iron cylinders, into which air is not allowed to enter, gas, water, oily matters, and other products are driven off, while bone charcoal is left in the cylinders. This product is used to take the colour out of raw sugars. After a time it becomes worthless for this purpose, when it is sold for fertilizing purposes, as all the lime phosphate still remains. The decomposition of bone black in the soil goes on slowly, and therefore it is not generally applied as such, but after treatment with sulphuric acid.

3. South Carolina and Florida Rock, Apatite, etc.—These mineral sources of phosphates are with great difficulty decomposed in the soil, and so slowly that in general it does not pay to put these ground rocks on the soil before putting them through a process which will make the most of the phosphoric acid readily available to the plant. This leads us to the consideration of:

4. Superphosphates.—In order to make these various phosphates more rapid in their action, they are treated with sulphuric acid, commonly called oil of vitriol. This treatment converts the insoluble phosphate into a soluble phosphate of lime called superphosphate of lime, sulphate of lime or gypsum being formed at the same time.

When bone, bone ash, bone black, or mineral phosphates are treated with sulphuric acid in sufficient quantity, the superphosphate formed contains the phosphoric acid in a form soluble in water. After standing, or when superphosphate is applied to the soil, the phosphoric acid is in the reverted form, as it has gone back to a form insoluble in water. This reverting of the phosphoric acid does not materially change its value as a fertilizer, for experiments have shown that plants can take up the phosphoric acid in this state as readily as in the soluble form. When the sulphuric acid is added in sufficient quantities to dissolve all the phosphates, some of the phosphoric acid remains in the insoluble form. This insoluble phosphoric acid is not as available to the plant, and it is much cheaper in the markets. In making an analysis of a fertilizer, therefore, we separate the phosphoric acid into three divisions of soluble, reverted and insoluble phosphoric acid, giving to each its value.

The "soluble" and "reverted" forms of phosphoric acid are both readily assimilated by plants, and hence are sometimes included under the common name of "available phosphoric acid." The "available phosphoric acid" in an analysis is equal to the sum of the "soluble" and "reverted" phosphoric acid.

Potassium.—Potassium ranks next to phosphorous as a valuable food for plants. Plants consume this element in comparatively large quantities, and some soils are unable to supply the demand; especially is this the case with light sandy soils.

Primarily the plants obtain potash from the decomposition of minerals or rocks containing potash. Thus felspar contains from 10 to 16 per cent. of potash. It is potash combined with silica and alumina. As such it is insoluble and not available to the plant. In the decomposition of this rock clay is formed and a soluble potash salt, which then becomes available. This decomposition goes on gradually, and thus, in most clay soils available potash salts are being continually liberated for the use of the plant. Stirring the soil accelerates this decomposition, and the presence of lime or gypsum increases decomposition. In such soils, therefore, the application of lime has another use besides that of plant food.

Plants vary largely as to the amount of potash they require. For example, an acre of wheat yielding 20 bushels requires about 28 pounds of potash; while an average crop of potatoes requires 100 pounds of potash per acre, and an acre of tobacco yielding 3,800 pounds of leaves and stalks assimilates over 200 pounds of potash. It is evident, therefore, that the continual cropping of soils with potatoes or tobacco will in time exhaust the potash supply. Light and sandy soils require this element from the start.

The sources of potash, as generally found in fertilizers, are:

1. Sulphate of potash.
2. Muriate of potash.
3. Kainit and sylvanite.
4. Cotton seed hull ashes.
5. Wood ashes.
6. More rarely the nitrate of soda.

The sulphate and muriate of potash, and kainit and sylvanite are imported from Germany, where they are mined in great abundance.

DIFFERENT FORMS OF FERTILIZERS.

Usually commercial fertilizers contain two or all of the essential ingredients, viz., nitrogen, phosphoric acid, and potash, but sometimes only one. Plain superphosphates contain only phosphoric acid. Ammoniated superphosphates contain nitrogen and phosphoric acid. Bone contains and is valuable for its nitrogen and phosphoric acid. Potash salts, of course, are valuable for their potash only. A complete fertilizer is one containing nitrogen, phosphoric acid, and potash.

INTERNATIONAL EXHIBITION OF MINING AND METALLURGY.

(FROM OUR LONDON CORRESPONDENT.)

WHEN the Mining Exhibition was opened at the Crystal Palace a few weeks ago, the non-technical press as in duty bound despatched its ordinary reporters to "do" the exposition in the regular way, and we, most of us, remember the chatty superficial columns that resulted from their efforts. We are loth to find fault with their well-meant endeavours; general journalistic work is their *métier*, and is usually executed on the whole fairly creditably. At the same time it was an open secret that considerable difficulty had been encountered in bringing all the exhibitors to the scratch, and that arrangements were in many cases far from complete, and in consequence no adequate report, balanced in all its parts, was practicable even by the omnicient writer for a London daily. To one watching the progress of affairs it is fairly manifest that a point has by this time been reached when a serious attempt may be made to give a comprehensive account of the great show now being held at Sydenham, without running the risk of self-stultification. As is usual with exhibitions of a really useful and important character held at the vitreous fiasco, which was once fondly supposed to be destined to educate and refine the irrepressible cockney, one notices a lamentable absence of visitors in the least degree more interested in what is truly an excellent collection than they would be in so many heterogeneous and purposeless objects in glass cases, and a high state of polish jumbled together to catch their eye as beads do that of a savage. A closer survey, though confirming this impression, leads to the belief that an unobstrusive minority is there with a definite purpose, going quietly to work in search of the information it needs, which the exhibition is well calculated to supply. It is to be hoped that the business directly and indirectly resulting will recoup those who have had the enterprise to exhibit.

The portion of the exhibition which perhaps attracts as mixed a band of spectators as any is that contained in the building devoted to machinery in motion, comprising as it does those directly interested in the plant displayed, children old and young who "want to see wheels go wound," and ladies not lacking the quality characteristic of their sex, which leads them to climb perilous ladders and brave dust and dirt in a manner as creditable to them as it is inexplicable by any male process of reasoning. Messrs. Davey, Paxman, & Co., of Colchester, provide the requisite power, having put down two locomotive boilers driving a horizontal engine (Class C, cylinder 20·5 by 32 in.), and supplying steam to other parts of the exhibition. They also show a 5 ft. Huntington Mill, being licencees for the manufacture of this now well-known apparatus; besides this they have also a couple of 8-h.p. portable engines, one single the other compound. Though hardly to be reckoned as machinery in motion there is an interesting exhibit by W. Firth, of Leeds, of his patent steel props for supporting the roofs of mines and collieries, the whole being shown in a full sized model close to the entrance.

To those who scorn chlorination and all its works, the exhibit of Messrs. T. B. Jordan and Son will appeal, disclaiming as it does the aid of "calcination, electricity," and that bugbear of the engineer, "chemicals." It consists essentially of a stone crusher, a pulveriser, and an amalgamator, and for free milling ores would be doubtless efficient. The tools shown by the Britannia Co., Colchester, and the exhibit of Messrs. Stott & Co., the gas engineers, though interesting, do not bear sufficiently directly on mining industries to merit detailed description. Of more importance are the exhibits of Hull, Robinson and Co., of Sheffield, who show a stone crusher of the Blake type, and a pulveriser with a capacity equal to that of a five-head stamp battery. The old-fashioned and well tried battery of stamps really seems at last in danger of being superseded. There is a distinct tendency to replace it by rotatory grinding arrangements, and its relegation to the museum is possibly only a question of time. Nevertheless it has done, and is doing, good work, and before banishment data whereon a comparison of its performances with those of more modern devices may be based, are very desirable. The same firm shows one of Sach's patent rock drills. These very necessary tools are naturally quite a feature of the exhibition; their name is legion and their din deafening, several being shown in action on such sturdy materials as granite. For some occult reason, the show-case of the Delta Metal Co. has been relegated to the shed designated the "Machinery Hall," and a good exhibit of this alloy, which is rapidly growing in favour among engineers, is in danger of being overlooked; ingots, forgings, castings, and finished goods are all worth notice, though the addition of a few fractured test pieces would be an improvement, as the tendency of all such compositions is to segregate, and specimens of excellent exterior sometimes show a startling lack of homogeneity when broken. Among the many other exhibits of which lack of space forbids more than mention, are the model of a revolving stamper shown by Messrs. Harvey and Co., which may be destined to resuscitate in a new form the older kind of pulveriser; and the very ingenious fire-extinguishing buckets, which can be drawn ready filled one after another from their tank, and which are lavishly distributed throughout the galvanised iron shed with praiseworthy forethought for its safety.

(To be continued.)

OZONIN.

OZONIN is a new bleaching agent just patented in this country by Dr. Ludwig Schreiner, of Stuttgart, and seems to possess wonderful properties. The Doctor takes 22 parts of hydrate of potash and dissolves them in 126½ parts of water, boils, and adds 125 parts of rosin; when this is dissolved, 150 parts of oil of turpentine are added, and after stirring this is dissolved; then 126½ parts of peroxide of hydrogen are added; the product is ozonin. If the peroxide is replaced by water, a solution possessing bleaching or oxidising properties is produced. Ozonin, according to the patentee, possesses greater oxidising powers than either turpentine alone or peroxide of hydrogen alone. Thus he says that if a solution of indigo oxide (whatever that may be) and caustic soda with sulphuric acid be taken, 5 drops of ozonin will destroy the colour in half an hour, while peroxide of hydrogen takes 10 drops and requires 48 hours, and the rosin-soap-turpentine solution takes 5 drops and 12 hours. Evidently ozonin has 24 times the strength of the latter mixture, and 192 times that of the peroxide of hydrogen. We are somewhat sceptical as to this, and if time permits shall test the point. A solution of 1 grm. of ozonin in 1,000 grms. of water is said to powerfully bleach textile materials; it is claimed to have disinfecting and antiseptic properties. The same patentee says that a bleaching agent can be made by agitating together 1 part of turpentine with 1,000 parts of water, making the materials to be bleached in this emulsion, exposing them to the air, and repeating these operations as often as necessary.

TEST FOR LEAD IN BLOCK TIN.—An optico-chemical method by which the presence of lead as an alloy of block tin may be speedily ascertained without injury to the siphon or other article constructed thereof, has been discovered by a German chemist. Ten milligrams of the suspected metal is scraped off, dissolved in nitric acid, and the solution made strongly alkaline with caustic potash. If this solution turns dark brown on the addition of sulphuretted hydrogen water, it contains lead. By making it exactly as above, diluting and comparing it with an accurately titrated solution of pure lead, it is said that 1 per cent. of the alloy can be detected with certainty, after a little practice.

WHITE LEAD AND ITS INVENTORS.

II.

SPECIALLY CONTRIBUTED.

(Continued from Page 159.)

THE great objection of the Dutch process is the length of time; it takes three months, and the dead loss of a large capital during that period, which increases the cost of production. The theory of the Dutch process is that the heat of the tan or dung causes the volatilization of the acetic acid from the vinegar which, acting on the lead, forms acetate of lead, and this is further acted on by the moisture which is present, forming hydroxide of lead, and thus producing a basic acetate of lead. This basic acetate of lead is now acted on by the carbonic acid liberated from the fermenting tan or dung and basic carbonate of lead (white lead) is formed, while the acetic acid is liberated ready to corrode more of the metallic lead. Based on this theory several processes have been patented, in which lead is treated with vapours of water, acetic acid, carbonic acid. These form the SECOND GROUP CHAMBER METHODS of white lead processes.

The earliest patentee of this method of making white lead is Sir James Creed, whose patent is dated 13th December, 1749; he makes white lead by the heat of fire (instead of horse dung, hitherto the common method), placing in chambers, rooms, stoves, ovens, or other close or confined places heated by fire, lead cast in thin plates, and raising or conveying therein the steam or vapour of vinegar or other acid raised by fire "till the plates are corroded thereby into flakes or dust of white lead." The steam or heat is regulated by sliders, valves, or the like.

As to the quality of the white lead produced by this process we have no authentic records, there is one defect, the absence of carbonic acid to ensure the proper production of the white lead.

Saxelbye (1806, No. 2,758) has some resemblance to Creed in the use of heat from the combustion of fuel, but he uses the old fashioned pots of lead and vinegar, and he takes care to maintain the temperature at from 90° to 100°F, a thermometer suitably placed recording it for the first ten or twelve days, after which the heat is increased 10° every eight days until 42 days have elapsed since the commencement of the operations when the process is completed and the white lead is ready to be finished. As with Creed's there is an absence of any provision for using carbonic acid.

John Mullins (1842, No. 9,501) starts with oxide of lead prepared by oxidising lead; this is moistened with water, placed in lead trays covered with a tight fitting lid, a number of these trays are placed in a chamber, and then through suitably arranged pipes is passed simultaneously currents of acetic acid vapour and of carbonic acid gas, the temperature is maintained at from 90° to 100°F, and the white lead begins to form, the process taking a few days for its completion. This method is open to the objection that the carbonation of the oxide is liable to be defective, the upper surface of the layers being more highly carbonated than the lower, and these latter are liable to be contaminated with acetate of lead formed through some of the acetic acid condensing and settling on the bottom of the trays,

Charles Reinhold Lothman, in his patent of 1847, No. 11,521, has an eye to the fact that the gas from fermenting malt liquors contains carbonic acid, and that when the fermentation proceeds long enough acetic acid is formed, he builds an airtight chamber, which, by any convenient means, can be kept at a temperature of from 72° to 96°F, rather a wide range, and in this he suspends sheets of lead, on the floor he places tubs containing fermenting malt and saccharine liquors, which evolve carbonic acid, after the fermentation is over, the liquors are withdrawn, mixed with vinegar, the combined liquors heated with steam, and the vapours thereof passed into the chamber; a fresh supply of the fermenting liquor being meanwhile placed in the chamber. Lothman begins at the wrong end, by using carbonic acid before he converts the lead into a state of basic salt on which it can act; his operations want reversing; further, the objection may be taken that if the sheets of lead drop down as they become weakened by corrosion and fall into the tub of liquor such is lost; and the amount produced lessened thereby. Lothman further says that the acids and vapours from breweries may be introduced into the chambers, only he gives no practicable means of attaining this object.

Thos. Richardson is the next inventor (1848, No. 12,246), and his process seems like an enlarged Mullin's process, only he starts with metallic lead, this he granulates, moistens with either acetic acid or a solution of acetate of lead, nitric acid or nitrate of lead may be used; and places the moist mass in layers in a series of chambers arranged on a framing of wood; into each chamber is sent through pipes currents of steam and carbonic acid gas, the temperature being maintained at about 90° to 100° F.; the lead is gradually corroded to white lead. This process is much more satisfactory than either of those previously noticed, and the product is likely to be a good one. The defect is the use of a large number of chambers, and the increased trouble involved thereby, together with the fact that the operation cannot be under control so well as when one large chamber is used.

In 1849, a patent, No. 12,724, was taken out by Rodgers, for sundry improvements in the manufacture of white lead, and which is, evidently, a second edition of Lothman's process, in a large chamber, generally made air-tight, in which sheets of lead are suspended, on the floor is placed vessels containing fermenting liquors and thus giving off carbonic acid gas, while steam passing through other vessels containing acetic or pyroligneous acid, sour beer or wine, carries acid vapours into the chamber, which is kept at a temperature of about 80° F., by steam pipes. This inventor has but a crude idea of the phenomena of white lead making, and his process is actually no better or different from that of Lothman who preceded him.

The next patent taken out by Burton (1858, No. 260) marked a real improvement in producing white lead, and which is now familiar under the name of the German process, and is probably now in use. In this process a series of large wooden chambers were used, in which, on suitable skeleton shelves, coils of sheet lead were placed; then, after closing all doors, air and steam was sent in through suitable pipes and apertures, the steam pipes having perforated branch pipes so that the steam was evenly distributed throughout the chambers, the result is the formation of a thick coat of oxide on the lead, when this has formed the steam is shut off, and that which is in the chamber allowed to escape. Then acetic acid vapours are sent into the chamber, which, acting on the oxide of lead, forms sub-acetate of lead; after a time the acetic acid vapours are stopped, and carbonic acid gas sent in, which decomposes the acetate forming white lead; in its turn this gas is stopped, then the steam and air are again admitted, and so on with the other gases alternately and in succession, until the whole of the lead has become carbonated, after which it is removed. This process yielded a good result, the white lead being nearly equal to Dutch process lead; considerable care had, however, to be exercised to get uniform results, if too much air was admitted oxide of lead was formed which tinted and reduced the body of the resulting lead, too much carbonic acid also resulted in the formation of a crystalline carbonate deficient in body although of good colour. If one large chamber fitted with glass windows were used and means provided whereby every stage of the process was under inspection and better control, there could scarcely be a better process than this for making white lead, it does not take long, from four to five weeks, and very good white lead is produced by it.

Rowland, 1861, No. 2,597, has an idea that the manufacture of white lead and vinegar can be carried on simultaneously, which, however, practical experience would soon convince him was not a practical possibility. There is nothing particularly striking about his invention, which follows on somewhat similar lines to that of Lothman and Rodgers. He constructs the walls of his chamber of glass, or other impervious material in the expectation of saving gas, which would be absorbed by wooden walls.

Robert Griffiths Hatfield is the next inventor to try his hand at making white lead in chambers, his patent being dated 1867, No. 1,728, he builds his with double walls, for what reason he does not say, and it is not readily discernible, the bottom of the chamber is made like a hopper, for a reason that can be seen when it is stated that after having placed the lead cast intogratings on trays, water and acetic acid are injected into the chamber in the form of spray, some will fall on the lead, much will fall to the bottom, and the hopper arrangement permits it to be drawn off. The chamber is kept heated by means of steam pipes; during the process, the water and acid form a basic acetate, but it is quite probable that this action will not be so complete as in the process of Burton described above; after the acid has acted, carbonic acid gas is forced in to form the carbonate, which is collected, washed, and dried. The results cannot be wholly satisfactory, as it will not be easy to regulate the action of the acetic acid, and this is not likely to be uniformly distributed over the chamber as it should be.

Messrs. Hannen, Pine and Woods, took out a patent in 1868, No. 2,998, according to which, they make white lead by placing lead in scraps in a chamber, sprinkling this with a mixture of 1 gallon of acetic acid, and 8 gallons of water, then passing in a current of carbonic acid gas at a temperature of 100-120° F., the gas is passed in excess, so as to decompose all the acetate; the inventors speak of sprinkling with a solution of chloride of soda, for what reason is not known, afterwards, with a solution of sodium carbonate at 120° F., presumably to ensure all the lead being converted into carbonate, there is no obvious improvement in this, over those previously described.

Asa P. Meylerts process simply consists in exposing lead in strips to the action of carbonic acid gas saturated with acetic acid by passing it through that liquid, steam also is sent in at the same time. The only novelty is in the use of carbonic acid gas saturated with acetic acid, in this respect Meylert had many followers.

Thompson, in 1873 took out a patent in which the novelty consisted, not in the process, but in the plant, which consists of a chamber; the lead is cast into sheets or granulated and placed on shelves arranged to

run on wheels into the chamber. The rest is a replica of Burton's process.

Messrs. Major, Wright and Jones have also patented 1869, 1260, a process for making white lead in chambers, the lead is placed on shelves, and steam saturated with ammonia is passed in for 11 hours at a temperature of 120°–140°F, then acetic acid vapours for some time, then carbonic acid gas; these operations taking from 14 to 28 days. There is not much novelty in this process, the effect of the ammonia cannot be very great, and as for the rest of the process it in no way differs from Burton's.

Brumlen, in 1875, took out a patent with a rather novel feature, he granulates lead, places this in a box made with a tight-fitting lid, and which can be made to oscillate, some acetic acid is run into the box, and then, by means of perforated pipes, air and carbonic acid are alternately passed in. Eight years afterwards he took out another patent on similar lines; in this case the lead was cast into wire or fine filaments, moistened with a solution of basic acetate of lead, and carbonic acid gas was passed in until a portion of the liquor taken out shows it to be neutral. Nothing is known by the general public as to the practical success of this process. Patentees do copy one another to an extraordinary extent. Dahm, in 1879, makes white lead by a process that is practically identical with that of Brumlen's; he has the same oscillating box, uses lead wire, moistens this with a solution of basic acetate of lead, then passes carbonic acid gas into the liquor. The liquor in the box is acid.

In 1877 Wm. Thompson took out a patent which was worked by the Innocuous White Lead Co. of London; this resembles Thompson's process of 1873. Mr. Thompson's chamber is made with a tight acid-proof bottom of glass or similar material, this is covered with acetic acid and water, steam pipes convey steam to heat the chambers and vapourise the acetic acid, the lead is cast into gratings and placed on shelves in a truck which is run on rails into the shed; carbonic acid is passed in as usual. There is a want of information as to quantities of acid used and length of time it takes to make the white lead. The product is quite satisfactory. In a subsequent patent, 1880, No. 4056, several points of detail are improved upon, instead of the acid liquor covering the bottom it is placed in gutters running along the bottom of the chambers, the steam pipes are also placed in these gutters; the carbonic acid is introduced at several points and in such a manner as to avoid the formation of currents and to obtain a more equal distribution of the gas over the chamber. Air is sent into the chambers at 80°–120°F. for 3-4 days so as to form the basic-acetate or sub-acetate; then the carbonic acid for from 12–28 days, according to the thickness of the lead which is being corroded, ⅛ in. lead takes about 12 days, ½ in. lead 28 days. The carbonic acid is sent in, in excess so as to ensure the complete carbonation of the lead.

(To be continued.)

Our Book Shelf.

INORGANIC CHEMISTRY: THEORETICAL AND PRACTICAL. A manual for students in advanced classes, by WILLIAM JAGO, F.C.S., F.I.C. Longmans, Green & Co.

This volume is one of a series of advanced science manuals in preparation by Messrs. Longmans, Green & Co., and as the author tells us in his preface, is the result of an endeavour to meet the requirements of students in the Science and Art Department's "Advanced" Chemistry. It is often repeated that there is no room for a fresh text book of Inorganic Chemistry of the present orthodox type. The book before us may be cited as a work that will make room for itself. Mr. Jago has been a well known and successful science teacher for many years, and his *Elementary Inorganic Chemistry* first published in 1881 has been long recognised as one of the best of its class. The present work is an admirable example of what a student's text book should be. The facts of the science are plainly and concisely stated. This is also particularly noticeable in the chapters devoted to laws of chemical combination, nomenclature, quantivalence and basicity. The subject of graphic notation has for years occupied a prominent place in the Science and Art Department courses, and we therefore find it receiving a due share of the author's attention. Some of the illustrations given of manufacturing operations are not of so modern a character as could be desired, as an instance, the fig. 69. of the lixiviating plant of an alkali works is the old terrace plan of Clement Desormes, which, if it ever worked at all in this country, has long been superseded by the Buff Dunlop or Shanks arrangement, with all the vats on the same level. Again, fig. 57. showing the arrangement of a sulphuric acid plant, is of a very obsolete type. Steam is never blown through the bottom of a chamber as shown in this figure. Neither is the chamber C.C., with its baffle shelves used to mix the gases. Nor is the cascade arrangement shown for admitting nitric acid used in this country, so that its insertion in a text book as a typical illustration is decidedly out of place. This, however, is probably more the author's misfortune than his fault; as on these points the inexorable publisher is generally all powerful, and a really new engraving is an important item in the cost of producing the book. Chemical text books are rarely up to date in these matters, and it is to be regretted that a few new blocks relating to such important industries as Sulphuric acid and Alkali making, as actually practised, have not been forthcoming. The other portions of the work are fully abreast with recent developments of the science. The book is very free from errors, the only ones we have noticed being the formula for molybdic and ferrous chlorides, pp. 127 and 133. Antimonious sulp*hate* on p. 290. Silver sulphide AgS p. 437. Silver nitrate Ag No_3 p. 438. Altogether, the book is one of the best we have seen, and should become very popular with science teachers and students.

BOOKS RECEIVED.

PRINCIPLES OF GENERAL ORGANIC CHEMISTRY by Prof. E. Hjelt. Longmans, Green & Co.

BACK NUMBERS OF THE CHEMICAL TRADE JOURNAL.

NOTICE.

AS we shall shortly clear out our stock of odd numbers of the earlier volumes of the Journal, those of our readers who require back numbers, to complete their sets, should apply for the same not later than October 4th. Some of the numbers are out of print.

NOTICE.

WE have decided to commence a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

October 7th.—"Manufacturing Smoke."
November 4th.—"Domestic Smoke."
December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the first lecture—"Manufacturing Smoke"—the chair will be taken by Alfred E. Fletcher, Esq., Her Majesty's Chief Inspector of Alkali, &c., Works; and models of various appliances will be exhibited.

Tea and coffee at 6-30 p.m. in the Exhibition room.

As the lecture room was much crowded at our last gathering, many visitors who arrived late being unable to find room, we have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

IMPROVEMENT IN MAKING SOAP.—The difficulties hitherto experienced in making a hard soap from resin, or from mixtures rich in resin, rise from the varying and considerable affinities for water possessed by resinate of soda made from resins of different qualities. Upon this idea, Herr Rodiger, of Magdeburg, in Germany, bases a new and improved method of soap making. He partially dehydrates and hardens resin soaps by the addition of soda ash, the proportion and conditions of application varying with the circumstances of each case. Here is an example of this improved process. To 40 parts of a solution of sodium hydrate of about 30° B., 100 parts of resin is added, and soda ash in quantity determined previously by trial (*e.g.* 10 per cent.) thrown in to effect the hardening spoken of above. If the action prove sluggish, it can be hastened by raising the temperature, and if on the other hand, it is too violent, it can be retarded by cooling. The mass is well stirred, put into small "forms," holding about 200 lbs., and the stirring continued till the hardening is complete. The time of hardening varies from a few minutes to 45 minutes, according to the quality of the resin. The addition of about 5 per cent. of salt promotes this hardening.—*Ex.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

VERAX.—Longmans and Co. are the publishers.

LIVERPUDLIAN.—We fear you have been cruelly hoaxed.

G.G.C. (Christchurch, N. Z.)—No. 174 sent to you a fortnight ago contains the information for which you ask.

C.H.N.—We would advise you not to risk your money.

MOTOR.—There are plenty of books on electricity applied to lighting and other purposes. Get Spon's catalogue.

CALCULUS.—(a) '0896 grammes is correct. (b) One litre of normal air weighs 1·293 grammes.

APPARATUS.—Advertise it in our Miscellaneous column.

BRUM.—There are plenty of science classes in your neighbourhood, but we have not heard of any good ones on Technical Chemistry.

AFRIKANDER.—The sample is common pyrites. H. P. G. P., Ltd. H. J. W. advertisements.

*** We do not hold ourselves responsible for the opinions expressed by our correspondents.*

TECHNICAL INSTRUCTION IN THE CHEMICAL TRADES.

(To the Editor of the Chemical Trade Journal.)

SIR,—The address with which Mr. Levinstein opened the chemical classes at the Technical School was of great interest; although I was in some respects rather disappointed with it, to me, it seems likely to convey a rather erroneous opinion as to the amount of instruction given in chemical subjects at the Technical School. Strangers would be led to infer that dyeing formed the only branch of chemical technology taught at the school, whereas, as a matter of fact, other important subjects are taught: metallurgy, brewing, soap-making, painters colours, oils, bread-making, and to ignore these and the teachers of them was a mistake. The address itself was also of too one-sided a character; dealing solely with tinctorial chemistry, to serve as an appropriate address with which to open the chemical classes; to ignore the other chemical trades was not the right thing to do.

However, leaving these alone, there are one or two points in the address that I should like to refer to. Mr. Levinstein's ideal of a technical school, and scheme of technical education is a good one, but is, I am afraid, rather an impracticable one, for many reasons. Possibly, Mr. Levinstein, like a good many others, overlooks one important fact, that the great bulk of the students at the Technical School are evening students, who, in the majority of cases, cannot go through such a course of technical instruction as is hinted at by Mr. Levinstein. This is only possible by students who can devote their whole time for three years, and have not to earn their living while going through this course. The only persons who are capable of doing so are the sons of masters and merchants, and it seems to me, that what many people want, is to provide schools and teaching for these persons at public expense, when they are quite able to bear it themselves. The result being that the teaching of the evening classes is starved to maintain an expensive staff of teachers for a comparatively small number of day students.

There is a movement on foot at the present moment to make the new Whitworth Technical School, a great central school for Manchester and district, and to decry the necessity for technical schools at surrounding towns, this is done with a view to getting the authorites of surrounding towns to contribute to the Manchester School and not to their local school, I have already pointed out that the majority of the students at these Technical Schools are evening students. Let me ask, is an artisan working at Bury able to attend the classes at Manchester? The short period between the hour of leaving work and the class times prevents this, to say nothing of the travelling expense; must a Bury artisan therefore be deprived of the advantages of obtaining technical education for the benefit of Manchester school? I think this is not desirable, and that therefore Bury, Bolton, Oldham, Rochdale, and even Salford should provide a Technical School wherein the artisans can obtain the technical instruction in their trades which they desire; there is no need for such schools to be as large as that of Manchester, or to have as wide a curriculum, but at least science and art classes should be formed, and also such technical classes as bear on the principal industries of the towns. Moreover, all these local technical schools might be federated with the Manchester school by a system of scholarships, by means of which deserving students might go through a two or three years' course in the day classes of the Manchester school, thereby receiving such higher education in technology as they could not obtain at their local schools.

There is one other point to which I should like to allude. There is a tendency on the part of school committees to spend large sums of money on useless elaborate buildings and on elaborate equipments; the result of which is that the teaching staff is starved for want of sufficient endowment to pay the teachers adequate salaries. Now after all is said and done, the teachers are the most important part of a technical school; much of the success of the school depends upon them, and yet there is a tendency on the part of committees to regard them as necessary evils, and to look on them with a rather disparaging eye. This should not be. The teachers should be regarded as the mainstay of the school, every endeavour should be made to keep them, and this can only be done by paying them good salaries and giving them due honour.

I am afraid of encroaching too much on your space, or I could say more. Perhaps with your permission I may in another letter ventilate some ideas I have on this subject. F.C.S.

Trade Notes.

DIOXYNAPHTHALENE $C_{10}H_6(OH)_2$ is a most valuable producer of colouring matters, especially for wool dyeing. Of this body there are known some 13 isomers, that is, compounds having exactly the same chemical composition and similar chemical relationships, but rather different properties, which differences may in the case of colouring matters show themselves in differences of shade. Not all these are of technical value. By treating these dioxynaphthalenes with nitrous acid they are converted into nitroso-dioxynaphthalenes $C_{10}H_6NO(OH)_2$, which are adjective colouring matters, *i.e.*, capable of dyeing mordanted fibres. The 1—8 nitroso compound is already in the market, under the name of dioxine, and recently the 1—4 nitroso compound has been patented. The latter dyes brown to black colours on wool mordanted with chrome; or it can be printed on cotton, using acetate of chrome as a fixer. These nitroso-dioxynaphthalenes are insoluble in water, and they are usually sent out in the form of pastes.

THE SHERRIN ELECTRICAL GENERATOR.—A new form of electrical generator and motor have been invented by Mr. J. Vaughan-Sherrin, by means of which the propulsion of boats, tricycles, and Bath chairs is effected without accumulators. The generator is a two-fluid primary battery, in which the anodes are of zinc and the cathodes of carbon specially prepared. The depolarizing liquid is a special composition which can be produced at a low cost; the zinc elements are immersed in plain water. The net cost of electric energy is estimated at from 9d. to 10d. per Board of Trade unit. The motor is a modified two-pole Gramme machine, having the field-magnets constructed in a special manner. It can be driven in either direction with equal efficiency, and is remarkably free from sparking at the commutator. It is very light, a one-horse power motor weighing only 62 lb., and it is well under control, being easily started, stopped, and reversed. It has been tested by Professor Sylvanus P. Thompson, and a half-horse power motor was found to give an efficiency of 65 per cent. It is stated that there is an entire absence of danger to those who are working the apparatus, as there is no chance of receiving a shock. Some trials were recently made with a tricycle, a Bath chair, and a 30 ft. boat fitted with the Sherrin system. The trials took place at the offices of the Sherrin Electric Generator Company, 48, Eagle Wharf-road, London, and were very successful, as demonstrating the capabilities of both the generator and the motor.

COPPER IN TENNESSEE.—The Ducktown copper mines, in the Great Smoky mountains of Tennessee, are perhaps the most ancient on the American continent. In recent years they have been unworked, and the valuable deposit left, where it has laid waiting for a miner's pick for ages. The want of fuel starved out or frustrated the modern miner. The mountains were stripped of their timber, and for miles around the bare uplands, denuded of trees, are a silent witness to the bygone labours of man. Timber being exhausted the miners resorted to charcoal, and that in turn was so remote and costly that the mines were abandoned, the busy scene was left to comparative solitude, and the miners went away. The problem of cheap fuel has now been solved, and a railroad penetrates the old Tennessean hills. The mines are to be transferred to an English syndicate, and when the furnace fires are once more lighted, the old era of industry will again return. The ore lies close to the surface, and is easy to secure. Other mine properties cover the deposit. It lies in three beds or strata, yellow sulphuret, black oxide, and red oxide. The red oxide yields 75 per cent. copper, the black oxide from 15 to 45 per cent., and the yellow sulphuret runs from 4 to 10 per cent. The principal mines are owned by the Union Consolidated Company, and during the thirteen years the company was in operation, they produced 5,000,000 pounds of copper, netting $1,500,000. If the English syndicate, as is anticipated, should open up the old mines and work them for all they are worth, it will add another chapter to the magic history of industrial Tennessee.—*Age of Steel.*

LUBRICANTS.

USERS of machinery differ more widely in their views as to the proper kind of lubricants for various kinds of machinery and in the use of them than upon almost any other subject. A great many pay but little attention to the matter, and seem to think anything will do so it is greasy. It is, however, a matter of very great importance, not only for the efficient working of a machine, but for its durability. The lubricant that is best for one class of machinery is unfit for another.

The main points in deciding the kind of oil best for a given journal are the weight, the size or the friction surface, the speed and the temperature at which it works ordinarily.

For heavy and slow-moving journals a thick oil or one with a heavy body is best, and a lighter or thinner oil for small high-speed journals is the fundamental rule in lubrication, but subject to many exceptions. It is useful only in determining the character of oil to be used.

There are three separate and distinct oils—animal, vegetable and mineral—but these are rarely used in a pure state, but in various combinations with each other. The machinery users never, nowadays, make their combinations for themselves, but buy from factories, where they are mixed according to theories that differ as widely as the materials and the state of the market. Many of the mixed oils put upon the market by leading oil manufacturers are excellent for the purposes recommended, but some are almost worthless, and a few actually injurious and dangerous.

The danger to be guarded against in the animal and vegetable oils above named is the acids they may contain if impure, or what they absorb in the process of manufacture or from exposure to the air. The acids in the oils rapidly corrode metals, and these acids may be generated by long exposure. Oils that have become rancid ought never to be used as lubricants. Many engineers will use the same oil for steam chests and interior parts of an engine as they do on ordinary bearings. This is all wrong. None but the purest and heaviest of neutral oils (that is, oils free from acids) should be used where they are subject to great heat or steam pressure, as these conditions often generate acid in the best of oil, corrode the piston, destroy the rings, and eat away the bolt-heads.

Of the fish oils sperm alone is a lubricant. All the rest are drying oils. Sperm is subject to the same conditions of acidity as those above named. From whatever cause acidity may arise, it is highly injurious to all parts of machinery with which it comes in contact, and should be carefully guarded against.

Hydrocarbons, or the mineral oils, are absolutely free from any tendency to dry or become acid, and it is an important fact that the admixture of a percentage of mineral oil even with an oil of high oxidizing or drying tendency effectually neutralizes that tendency. While mineral oil will not, when mixed with an acid oil, neutralize the acidity, yet it will greatly retard its chemical action in corroding metal by reducing the proportion of acid. These are the reasons why the manufacturers of the best lubricants use an admixture of mineral oils. The mineral oils alone are not very good lubricants, but will do for light machinery running in a low temperature. They need a body of animal or vegetable oil, and the amount of body in the sample of mixed oil can be approximately estimated by its pluidity at blood heat.

In using a lubricant composed wholly or in part of mineral oil, there is one point that should be well understood, and carefully looked after. That is the "flash" or firing point: This is the temperature at which the gases given off will flash or take fire from a flame. The flashing point of animal and vegetable oils is so high that it does not, under any conceivable conditions, become a factor of danger in a lubricant, but some of the mineral oils will flash at the ordinary summer temperature of the air. Oil consumers should insist upon some guarantee in this respect from the men who ask them to purchase their oil. More fires are started in woodworking plants and cotton mill, gins, etc., from the use of light oils, or oils with low flash points, than from any other single cause. A case in point occurred recently in the pumping station of the works of Nashville, Tenn. Fire broke out suddenly in broad daylight and burned so fiercely that the whole building was destroyed. No explanation has been given by the parties in charge of the works, except that the floors (it was a very old building) were saturated wtih oil. One labourer who was near by stated that a wrist pin was very hot. That explains the mystery. It is not at all rare to find samples of mixed oils that are good lubricants and fairly safe under ordinary temperature, that will give off inflammable gases at a temperature under 200°. In view of the extensive use of mineral oil, both pure and mixed with other oils,, the cost of insurance and the safety of life and property demand that a careful consideration should be given to the flash, or firing point of the oil used. For ordinary machinery it should not be less than 300° and for cylinders not under 500° Fah.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

Prices for caustic soda still remain firm for early deliveries as quoted last week, but there is nothing of importance being done for forward deliveries meantime. The prices f.o.b. Liverpool are:—70%, £11. 10s. to £11. 12s. 6d.; 60%, £10. 10s.; and 60% cream, £9 10s. per ton; 74%, £12. 15s. per ton Liverpool, and 77%, £13 10s. f.o.b. Tyne. For soda ash of all kinds the demand is good, and prices are firm at 1¼d. per deg. f.o.r. at works for caustic ash, and 1⅛d. per deg. for carbonated. Ammonia ash, 58%, is also reported higher, and a leading firm of makers have put up their prices this week. Soda crystals are firm in sympathy. Chlorate of potash has realised higher prices during the week, and is now quoted 5¼d. to 5½d. per lb. Sulphate of copper is firm at £19 10s. for early deliveries, and higher prices asked for future deliveries. Bleaching powder has been selling steadily at £5. 5s. to £5. 7s. 6d. per ton at makers' works. Acetates of lime, brown and grey, are without change in price, but firm. Acetic acids are in fair demand for manufacturing purposes. Pure acetic acid is quoted lower in some quarters. Acetate of soda has become scarce, with consequent advance in price to £16. 15s. c.i.f. Sugar of lead is firmer, as is also the tendency in other lead salts, owing to advance in the metal. Tin crystals dearer, 6⅞d. to 7d. per lb In caustic potash, and carbonate, there is still scarcity of supply, with higher prices ruling for spot deliveries. Prussiate of potash also scarce, and ruling from 9¼d. to 10d. per lb. Carbolic acid crystals do not move off to any large extent, but with the extremely low prices now touched a better demand may be looked for. Vitriol is in good demand, and prices have advanced, owing to the scarcity of supply in certain districts.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron: Scotch warrants closed at 52s. 10½d. cash, and 53s. 2d. one month. Middlesbrough, 49s. 6d. cash; hematite, 59s., cash. Copper steady. Chili bars, G.O.B.'s and G.M.B.'s closed at £59. 7s. 6d. to £59. 15s, cash, and £59. 17s. 6d. to £60. 5s. three months. Tin easier: Straits closed at £101. 15s. to £102. 5s.; Australian, £101. 15s. cash, and Straits three months, £99. 2s. 6d. to £99. 12s. 6d.; English ingots, £104. Lead: Spanish, £14. 7s. 6d.; English, £14. 12s. 6d. to £14. 15s. Spelter: Silesian ordinary, £25. Quicksilver, unchanged. Copper shares, flat: Rio Tinto fell ¾ to 24¾; Mason and Barry, 1⅛ to 7⅛; Tharsis, ⅛; to 5⅛; Cape, ⅛ to 5. Copiapo ⅛ to 3.

GLASGOW, WEDNESDAY.—Market continues firm with a fair business. Scotch done at 52s. 10d., 52s. 9½d., and 53s. 1d., cash, also at 53s. 1d., 53s. 4d., and 53s. 3d., one month; closing buyers at 53s. cash. sellers ask ½d. more. Middlesbrough done at 49s. 10d. one month; closing buyers at 49s. 6d., cash, and 49s. 9d. one month, sellers ask 1½d. more. Hematite closes with buyers at 59s. 1½d. cash, 59s. 4½d. one month, sellers ask 1½d. higher. Market closed to-morrow.

WOLVERHAMPTON, WEDNESDAY.—On 'Change this afternoon there was not much business transacted, both sellers and consumers proceeding tentatively, pending the quarterly meetings, which are to be held next week. The probability seems to be that marked bars will not then be advanced, but will remain at £8. 10s. until the recent improvement in trade becomes more decided. Second and third class qualities of iron will, however, probably be dearer. The sheet makers meet to-morrow in Birmingham to decide whether or not to re-establish an official quotation. Doubles are now £8.

TAR AND AMMONIA PRODUCTS.

The benzol market is steady, and business for forward delivery is reported at 4s. 3d. for 90's., and 3s. 2d. to 3s. 3d. for 50,'90's. To-day's market price is about 4s. 2d. for 90's. The solvent naphtha market is firm, prices being well maintained. Creosote is moving off freely at old rates. Anthracene keeps up in value. Nothing is able to be bought under 1s. 6d. for 30% A. and 1s. 2½d. for 30% B. The pitch market is very flat, business having gone spark out.

The sulphate of ammonia market is firm, and on the whole a steadier feeling may be said to prevail. Leith is again firm at £11. 10s. with rather less offering, and at Hull, business has been done at £11. 10s., while Liverpool transactions are on the basis of £11. 12s. 6d. The production is of course now increasing, so far as gas works are concerned, but there are no country parcels pressing upon the market while dealers are apparently in need of all they can get. London prices remain unaltered, so that a decline in value is therefore improbable.

THE COPPER MARKET.

Messrs. Harrington and Co.'s copper report, dated Liverpool, 1st October, 1890, states:—Chili Copper Charters for second half of September are not yet to hand.

Since our last, the market for G.m b. s G.o.b.s which was steady at £61. 10s. cash, and £61. 17s. 6d. three months, fell on the advance of Bank Rate to 5 per cent. to £61. and £61. 6s. 3d. respectively, and the heavy fall in silver, with the rumours of still dearer money, have further depressed the market, but we close steady at £59. 7s. 6d. cash, and £59. 17s. 6d. three months.

Owing to a mistake in the Havre stocks given to us last fortnight there ought to have been a decrease of 675 tons in the Liverpool. Swansea, London, and Havre stocks, instead of an increase of 1,750 tons as stated; but there is an increase of 220 tons for this fortnight, making a decrease of 455 tons for the month.

The present stock of English G.m.b 's in warehouse, Liverpool and Swansea, is 3,632 tons, against 3,868 tons on 15th ult., showing a decrease of 236 tons.

Refined and manufactured sorts are quieter. Quotations being—English tough £63. 10s. to £64. 10s., best selected £67. to £68. India sheets £68. to £69., strong sheets £73. to £74., and yellow metal sheets 6½d. per pound.

The sales of furnace material comprise at Liverpool—200 tons Boston Montana Matte, to arrive at 11s. 9d.; 20 tons Portuguese precipitate, at 12s.; 300 tons ordinary Anaconda Matte (re-sale), at 12s.; 100 tons Cueva de la Mora precipitate, at 12s.; 17 tons Peruvian ore, at 11s. 3d.; 50 tons English precipitate, at 12s. 6d.; 156 tons Mexican ore, at 11s. 9d.; 150 tons Alosno precipitate, to arrive, as follows: 80 tons (about 80 per cent.) at 12s. 6d., and 70 tons (about 50 per cent.) at 11s. 10½d.; and 70 tons Penaflor Spanish Ore, at 11s. 3d. per unit. At Swansea—1,775 tons Quebrada ore (out of stock), on private terms; 40 tons Alosno precipitate, at 12s.; and 140 tons Mason's precipitate (out of old stock), at 11s. 4½d. per unit.

REPORT ON MANURE MATERIAL.

Business during the past week has been on a moderate scale, without much alteration in prices either for phosphatic or for nitrogenous material.

Mineral phosphates continue firm, and any contracts entered into for delivery far ahead have been at very full prices. The value of hot-air-dried Bull River rock remains 11d. per unit c.i.f. in cargoes to U.K., and of land rock 10d. per unit. In the higher grades of Canadian there is not much offering, and full prices would have to be paid, but of the lower grades there is still an ample supply. Florida rock is again exciting attention, but it does not seem that as yet the shippers have their arrangements so far completed as to be able to deliver very large supplies. For 60%, 11d. per unit is asked, and for 70%, 13d. per unit; but these prices are probably somewhat above what buyers are prepared to give.

There is nothing fresh to report in cargoes of River Plate bones to U.K., Sellers still asking £5. 12s. 6d., and buyers being indisposed to give that price. Easier exchange with the East admits of easier prices, and £5. 16s. 3d. would probably now be accepted for Bombay bone meal for shipment ahead, and £5. 12s. 6d. for crushed Kurrachee bones. Spot price of Bombay bone meal is £6. ex store, and sales have been made thereat. Common grinding bones are somewhat easier, and the value cannot now be put above £5. 2s. 6d. ex quay. Nearest value of River Plate bone ash is £5. 7s. 6d. on 70% nett, delivered U.K. or Continent.

Nitrate of soda is firm without much change in values. Nearest value of large due cargoes is 8s. 6¾d., and for small ones at least ¾d. per cwt. more would have to be paid. October-November shipments are worth 8s. 10½d. Spot price is firm at 8s. 6d. for ordinary quality and 8s. 7½d. for refined.

Dried blood remains quiet at 10s. 3d. to 10s. 6d. f.o.r., according to position of the works. A parcel of River Plate, shortly due, has been sold, it is undertood. at 10s. 3d. per unit ex quay.

Nothing fresh to report in Ammonite or Kainit.

Supers remain as last quoted—say at 50s per ton., in bulk, f.o.r. at works, prompt delivery or delivery ahead.

THE LIVERPOOL COLOUR MARKET.

Colours have ruled exceedingly steady this week at very even prices. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire, common, 40s., medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc without alteration. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron, common, £6.; medium, £10.; finest, £20.

THE LIVERPOOL MINERAL MARKET.

On the whole our market has ruled steady during the week. Manganese: There has been a considerable increase in arrivals, which have ruled above the average in quantity. As, however, they were anticipated, prices are unaffected and remain firm. Magnesite: No change to report, stocks, still large; raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground, £11. Bauxite (Irish Hill brand): The demand continues further to increase, and prices have advanced: Lump, 22s.; seconds, 18s.; thirds, 14s.; ground, 35s. French chalk: Arrivals have been under the average, and a brisk business has been done at full prices, especiallly for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate quiet; without alteration in prices. Sulphate in strong demand, especially for finest "Angel White." Pumicestone unaltered: ground at £10., and specially selected lump, finest quality, £13. Iron ore easier, whilst there is more inquiry for Spanish manganiferous; Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore quiet. Emerystone: No alteration to report; prices steady. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal inquired for, bringing better prices. Chrome ore flat. Antimony ore and metal in demand at full figures. Asbestos in strong demand, especially Canadian rock, which commands full figures. Potter's lead ore of best and "standard" brands in request; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Good qualities in demand at top prices. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, steadier. Plumbago: Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay more doing—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), firm, finest quality, 22s.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The market here is a trifle excited, from various causes, and prices for the most part are on the move. In the paraffin section there is no change, but considerable firmness prevails, and the manufacture looks forward to possible obstruction from the quarter of the shale miners, who talk just now of again bringing the pressure of the Union to bear on the masters. The excitement is at the same time partly due to the existing crisis in the Scotch iron manufacture, threatening the blowing out of the remainder of the blast furnaces. Caustic soda is dearer, and saltcake since last week has gone higher than for a long time. Bicarbonate of soda is up, refined alkali is fractionally firmer, and chlorate of potash and sulphate of copper are both dearer. Bichromate of potash and bichromate of soda are not changed as yet from the quotations of last week, but it has been whispered that the Scotch makers, who so long combined for rigid prices, and who so lately entered upon a trial of each for his own hand, are already tired of the loose and incutting method, and seek a revival of the old long standing collaborations and a rise in the prices. Soda crystals and sulphate of ammonia (unlike most of the others) are easier, and the latter has been very quiet. Chief prices current are:—Soda crystals, 56s. net Tyne; alum in lump £5., net Glasgow; soda ash, 1⅛d. less 7½%, Tyne; caustic soda, white, 76°, £13. 5s., 70/72°, £11. 10s., 60/62°, £10. 10s., and cream, 60/62°, £9. 10s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £6., and 1 cwt. casks, £6. 10s., net Tyne; refined alkali, 48/52°, 1⅛d., less 1¼% Tyne; saltcake, 40s.; borax, English refined, £30., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 7s. 6d. to £5. 12s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., less 5% f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. less 5% f.o.b. Glasgow; chlorate of potash, 5¼d., less 5% any port; nitrate of soda 8s. 6d. to 8s. 7½d.; sulphate of ammonia, £11. 5s. to £11. 7s. 6d., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £19. 5s., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3⅜d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny, less); ditto (lubricating), 865°, £5. 10s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were *nil*.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market continues quiet but firm; the prices on the whole have not varied much. Caustic soda still maintains its price. Soda ash and crystals have been rather easier, but the former class stronger. Bleaching powder remains unaltered. There are numerous enquiries for forward business, and buyers are more disposed to cover for next year's consumption.

For prompt delivery, quotations are as follows:—Bleaching powder, in softwood casks, £5. 5s. to £5. 7s. 6d. per ton; hardwood casks £5. 7s. 6d. to £5. 10s. od. per ton. Caustic soda, 77%, £12. per ton; ground and packed in 3-4 cwt. barrels, £15. per ton; soda ash, 48/52%, 1¼d. per degree nett to 1⅜d. less 7½%; soda crystals, 55s. to 56s. per ton; sulphate of soda, ground and packed in casks, 45s. per ton; recovered sulphur, £4. 5s. per ton; chlorate of potash, 5¼d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton, all f.o.b. Tyne, or f.o.r. makers' works.

There is little change to report in small coals for manufacturing purposes. Price, if anything, is rather easier. Northumberland steam small, quoted from 6s. 6d. to 7s. per ton, and Durham small, 7s. to 8s. per ton, according to quality.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

J. WEBSTER and T. H. WILLS, under the style of Webster and Co., Southwark-bridge-road, London, S.E., ink manufacturers.

J. WOLSTENHOLME and W. W. WILDE, under the style of J. Wolstenholme and Co., Ashton-under-Lyne, drysalters, as far as regards W. W. Wilde, deceased.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis.

APPLICATIONS FOR LETTERS PATENT.

Distributing Fertilizers. J. McKidd. 14,492. Sept. 15.
Patent Fuel Machine. J. Pring, F. J. Heybyrne and G. H. Llewellyn. 14,498. Sept. 15.
Patent Fuel Machine. J. Pring, F. J. Heybyrne and G. H. Llewellyn. 14,499. Sept. 15.
Manufacture of White Lead. T. H. Cobley and W. Elmore. 14,513. Sept. 15.
Utilizing Heavy Oils. J. R. Shearer. 14,526. Sept. 15.
Regulating Valves. T. Penn and A. E. Penn. 14,531. Sept. 15.
Machine for treating Ramie. E. C. Marc. 14,535. Sept. 15.
Phosphoric Acid. A. Boake. 14,542. Sept. 16.
Improvements in Furnaces.—(Complete Specification). E. F. Edgar. 14,543. Sept. 16.
Process for Purifying Brine.—(Complete Specification). H. J. Allison. 14,544. Sept. 16.
Improved Steam Trap.—(Complete Specification). J. Cormack and W. Cormack. 14,558. Sept. 16.
Deposition of Alloys. S. O. Cowper-Coles. 14,565. Sept. 16.
Manufacture of Parchment Paper. J. L. Geddes, and J. W. Johnston. 14,586. Sept. 16.
Artificial Manures. E. Pearman. 14,587. Sept. 16.
Charging Inclined Gas Retorts. W. P. Lampard. 14,618. Sept. 16.
Colouring Matters. J. Y. Johnson. 14,620. Sept. 16.
Colouring Matters. B. Willcox. 14,621. Sept. 16.
Manufacture of Metallic Articles by Electrolysis. A. S. Elmore. 14,624. Sept. 16.
Manufacture of Nitrated Starch. (Complete Specification.) W. Schückher. 14,625. Sept. 16.
Ale and Beef Tonic.—(Complete Specification.) W. S. Hicks and the Ale and Beef Co. 14,632. Sept. 16.
The Dry Concentration of Ores. C. S. Bailey. 14,640. Sept. 16.
Utilising the Pressure of Compressed Gases. The Manchester Oxygen (Brins Patent) Co., Ltd., and W. M Jackson. 14,645. Sept. 17.
Tin and Terne Plates. C. A. Burghardt. 14,646. Sept. 17.
Obtaining and Applying Natural Gas. J. Balbirnie. 14,648. Sept. 17.
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Deodorising Sewer Gas. J. A. G. Ross. 14,671. Sept. 17.
Apparatus for the Consumption of Gas. J. Enright. 14,680. Sept. 17.
Purifying Greasy and Oleaginous Bodies. J. B. Torres and J. D. Benjumea. 14,697. Sept. 17.
Improvements in Gas Producers. H. P. Holt. 14,707. Sept. 17.
Charging and Drawing Gas Retorts. J. Ruscoe. 14,720. Sept. 17.
Washing and Concentrating Ores. (Complete Specification). W. Schroller. 14,723. Sept. 17.
Automatic Regulators. H. Brier, and the Scotch and Irish Oxygen Co., Ltd. 14,725. Sept. 18.
New Breakfast Beverage.—(Complete Specification). R. Miller. 14,726. Sept. 18.
Fire Bars and Furnace Grates.—(Complete Specification). D. J. Morgan. 14,738. Sept. 18.
Construction of Thermometers. G. A Simmons. 14,760. Sept. 18.
Mixing Machines. R. Hartmann. 14,769. Sept. 18.
Electro-deposition of Metals. C. T. J. Vautin. 14,776. Sept. 18.
Improvements in the Manufacture of Sodium. G. G. M. Hardingham. 14,781. Sept. 18.
Combustion of Coals in Domestic Grates. T. Fraser. 14,818 Sept. 19.
Transportation of Mineral Waters. E. de Pass 14,820. Sept. 19.
Recovering Gold from Pulverised Minerals. E A. Cowper. 14,828. Sept. 19.
Bleaching Ground Cork. F. Walton. 14,829. Sept. 19.
Treatment of Hydro-carbons. J. H. W. Stringfellow. 14,832. Sept. 19.
The Manufacture of Colouring Matters. J. Y. Johnson. 14,836. Sept. 19.
The Manufacture of a Reducing Agent. C. E. Bernard. 14,837. Sept. 19.
Mineral Wool.—(Complete Specification.) W. H. Kennedy. 14,846. Sept. 19.
Deodorising, Disinfecting, and Oxidizing Substances. R. Leigh. 14,858. Sept. 20.
Manufacture and Storage of Oil Gas. E. Sparsholl. 14,873. Sept. 20.
Apparatus for Filling Aerated Beverages. A. Hanesworth. 14,875. Sept. 20.
Dyeing, Bleaching, and Washing Cops of Yarn.—(Complete Specification.) W. P. Thompson. 14,897. Sept. 20.
Extracting Gold from Crushed Minerals. O. Imray. 14,904. Sept. 20.
Purification of Coal Gas. C. W. Jones. 14,906. Sept. 20.

New Companies.

BURNARD AND ALGER, LIMITED.—Registered by Richard Jordan, 120, Chancery lane, W.C., on the 19th September, with a capital of £200,000., in 2,000 shares of £100. each. The first 500 shares to be preference shares. Objects:—To acquire the business of chemical manufacturers, metal extractors, and general merchants, now carried on by William Henry Alger and Robert Burnard at the Plymouth Chemical Works, Cattedown, Plymouth, under the style or firm of "Burnard, Lack, and Alger," and the business of wharfingers and warehouseman now carried on by William Henry Alger, and Robert Burnard at the Cattedown Wharves, Plymouth, under the style of "Burnard and Alger"; and to acquire and take over the assets and liabilities of the said William Henry Alger and Robert Burnard in connection with such businesses, and also all the powers, rights, privileges, etc., granted by an Act of Parliament, 50 and 51 Vict., entitled "Burnard and Alger's Cattedown Wharves Act, 1887." The subscribers are:—

	Shares.
William Henry Alger, The Manor House, Stoke Damerel	1
Robert Burnard, 3, Hillsborough, Plymouth	1
Charles Frederick Burnard, Chatsworth Lodge, Mannamead, Plymouth	1
Edith Elizabeth Alger, The Manor House, Stoke Damerel	1
Harold Alger, The Manor House, Stoke Damerel	1
Fanny Louise Burnard, 3, Hillsborough, Plymouth	1
Arthur Henry Bagnold, Borstal Cottage, Rochester	1

J. E. H. GORDON AND COMPANY, LIMITED.—This company was registered on the 19th inst., with a capital of £50,000, in £10. shares, to acquire as a going concern the business of J. E. H. Gordon, chemical engineer. The subscribers are:—

	Shares.
J. E. H. Gordon, C E., 1, Queen's-gate-gardens	1
W. J. Rivington, 21, Gledhow-gardens, South Kensington	1
Mrs. J. E. H. Gordon, 1, Queen's-gate-gardens	1
Mrs. W. J. Rivington, 21, Gledhow-gardens	1
Mrs. E. C. Gordon, Hornlow-cottage, Campden-hill	1
Miss E. C. Gordon, Hornlow-cottage, Campden-hill	1
H. Sinclair, 11, Pall Mall	1

MILLOM AND ASKAM HEMATITE IRON COMPANY, LIMITED.—This company was registered on the 23rd inst., with a capital of £250,000., divided into 10,000 cumulative £7. per cent preference and 15,000 ordinary shares of £10. each, to take over as going concerns the several businesses now carried on at Millom, Cumberland, by the Cumberland Iron Mining and Smelting Company, Limited, and at Askam, Lancaster, by the Askam and Mouzell Iron Company, Limited. The subscribers are:—

	Shares.
A. Bonar Law, 7, Royal Bank-place, Glasgow, iron merchant	1
D. Cairney, 24, George-square, Glasgow, stockbroker	1
W. Jacks, 7, Royal Bank-place, Glasgow, iron merchant	1
Sir J. Ramsden, Barrow-in-Furness	1
T. B. Massicks, Millom, iron master	1
A. H. Strongitharm, C.E., Barrow-in-Furness	1
Henry Cook, Barrow-in-Furness, railway manager	1

W. CAMERON AND COMPANY, LIMITED.—This company was registered on the 19th inst., with a capital of £15,370., in £10. shares, to take over the business of W. Cameron and Co., brewers, maltsters, etc., in consideration of 1,530 fully paid shares. The subscribers are:

	Shares.
Walter Scott, Bishop Auckland, brewer	1
Mrs. Scott, Bishop Auckland	1
Mrs. William Andrew, Glasgow	1
Mrs. J. J. Tait, Etherley, Durham,	1
J. Kilburn, Bishop Auckland, tea merchant	1
Wm. Andrew, Glasgow, grocer and wine merchant	1
J. J. Tait, Etherley, Durham, colliery clerk	1

YEADON GAS RETORT SYNDICATE, LIMITED.—This syndicate was registered on the 23rd inst., with a capital of £1,250., in £50. shares, to acquire the patent No. 19,183 of 1889, granted to John Arthur Yeadon and Wm. Adgie, for improvements in retorts or furnaces for the distillation of coal, or other analogous purposes. The subscribers are:—

	Shares.
R. Middleton, Leeds, engineer	1
J. Ward, Leeds, provision merchant	1
W. G. Hobson, Leeds, architect	1
J. Hardcastle, C.A., Leeds	1
J. Bowling, Leeds, solicitor	1
J. A. Yeadon, Leeds, engineer	1
W. Adgie, Leeds, accountant	1

IMPORTS OF CHEMICAL PRODUCTS AT THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Sept. 20th.

Antimony Ore—
France, 20 t. H. R. Merton & Co.
Sydney, 72 Hoare, Wilson & Co.

Alum—
Holland, £25. Ohlenschlager Bros.

Acetic Acid—
Germany, 3 pks. H. J. Perlbach & Co.
Holland, 79 Beresford & Co
" 56 A. & M. Zimmermann

Acid *(otherwise undescribed)*
Holland, 50 pks. Beresford & Co.
" 1 Barr, Moering, & Co.
" 60 A. & M. Zimmermann

Alkali—
Holland, 120 c. E. Olyett & Sons
France, 18 P. Hecker & Co.

Barytes—
Holland, 46 pks. Magee, Taylor, & Co.
" 22 cks. W. Harrison & Co.
" 45 A. Boltz
Germany, 24 O'Hara & Hoar
" 23 Constable, Henderson, & Co.
" 45 W. Harrison & Co.
Holland, 22 O'Hara & Hoar

Borax—
Germany, £25. F. Stahlschmidt & Co.
" 56 "

Bones—
Melbourne, 3 t. Culverwell, Brooks, & Co.
Sydney, 8 Flack, Chandler, & Co.
New Zealand, 1½ "
Montreal, 100 C. A. & H. Nichols
Morocco, 3 J. Clark

Boracic Acid—
Italy, 20 pks. J. Puddy & Co.

Barium Chloride—
France, 10 cks. Petri Bros.

Brimstone—
Italy, 46 t. J. Kitchin, Ltd.
" 550 Brandram Bros. & Co.
" 5 Fuerst Bros.
" 5 Type & King

Cream of Tartar—
Holland, 8 pks. Middleton & Co.
" 13 B. & F. Wf. Co., Ltd.
Spain, 12 "
" 3 cks. Evans, Lescher & Co.
France, 5 W. C Bacon & Co.
" 3 E. W. Carling & Co.

Caoutchouc—
E Indies, 98 c. L. & I. D. Jt. Co.
Zanzibar, 22 "
" 43 Beresford & Co.
" 82 Anderson, Weber, & Smith
Belize, 14 Belize Estate & Prod. Co.
Holland, 50 Prop. Bull's Wf.
Zanzibar, 56 L & I. D. Jt. Co.
" 357 "
Natal, 10 J. T. Rennie, Son, & Co.
France, 124 Prop. Bull's Wf.

Chemicals *(otherwise undescribed)*
Germany, £97. A. & M. Zimmermann
" 9 Craven & Co.
" 28 H. Lambert
" 25 T. H. Lee
" 40 Phillipps & Graves

Dyestuffs—
Anthracene
Holland, 34 pks. Burt, Boulton, & Co.
Cochineal
Canaries, 7 pks. Swanston & Co.
Indigo
Germany, 2 cs. Elkan & Co.
E. Indies, 86 chts. L. & I. D. Jt. Co.
Turkey, 1 "
E. Indies, 30 T. H. Allen & Co.
Argols
Italy, 200 pks. Thames S. T. Co.
Patras, 6 C. W. Hancock & Co.
Rennet
Denmark, 10 cks. G. Scrutton & Co.
Gambier
Ceylon, 848 pks. L. & I. D. Jt. Co.
Cutch
E Indies, 74 Mee, Billings, & Co.
" 629 L. & I. D. Jt. Co.
" 651 Anderson, Weber, & Smith

Dyestuffs—*continued.*
Mimosa
Melbourne, 46½ t. Baxter & Hoare
Tanners' Bark
Belgium, 10 t. G. S. N Co.
" 40 J. J. Williamson & Sons
" 24 J. Graves
" 5 Bevington & Sons
" 24 Sawer Mead, & Co.
Natal, 30 Hicks, Nash, & Co
Durban, 12 A. & W. Nesbitt
Adelaide, 6 Goad, Rigg, & Co.
Sydney, 100 Anning & Cobb
Adelaide, 60 Baxter & Hoare
Sydney, 15 Dalgetz & Co., Ltd.
Extracts
France, 210 pks. Prop. Chmbln's Wks.
Belgium, 7 cs. Nugent Bros.
" 40 T. H. Lee
France, 200 L. J. Levinstein & Sons
E. Indies, 1 pkg. P. Macfadyen & Co.
France, 29 Union Lighterage Co., Limited
" 3 Prop. Chmbln's Wf.
U S, 50 L. & I. D. Jt. Co.
Sumac
France, 130 bgs. Beresford & Co.
Italy, 500 W. France & Co.
" 100 Hicks, Nash, & Co.
" 250 Ralli Bros.
" 500 W. Shelcott
" 300 A. Hagan
Tripoli, 1 200 Soundy & Son

Glucose—
U. States 50 pks. 280 cwts. Page, Son & East
Germany, 200 200 Horne & Co.
" 25 205 L. Sutro & Co.
" 200 200 J. Barber & Co.
U. S, 185 1,122 Prc. Scott's Whf.
" 400 400 Allan Bros.
" 125 613 Union Lighterage Co.
" 166 896 L. Sutro & Co.
Germany 400 400 Baxter & Hoare
" 150 216 H. A. Litchfield & Co.
" 1,000 1,000 R. E. Drummond & Co.
" 100 100 Botolph & Nichs Whos Co., Ld.
" 100 100 Barrett, Tagant, & Co.
" 800 800 J. Barber & Co.
France, 100 100 "
" 200 200 M. H. Voss
" 300 300 Seaward Bros.
" 300 300 De Paiva, Norman, & Co.
U. S., 50 300 Pillow, Jones, & Co.

Gutta Percha—
Holland, 224 c. Robinson, Roberts, & Co.
Penang, 2½ L. & I. D. Jt. Co.

Glycerine—
Germany, £105. Beresford & Co.
" 100 H. Lambert
Holland, 536 Spies Bros. & Co.

Guano—
Peru, 1,300 t. Anglo Contl. G. Wks.

Isinglass—
N. Russia, 3 cs. J. Vickers
E. Indies, 6 pks. L. & I. D. Jt. Co.

Iron Peptonate—
Belgium, £59. D. C. Thomas & Sons

Manure—
Holland, 205 t. Anglo Cntnt. G. Wks.
Germany, 100 A. Hunter & Co.
Belgium, 140 Adam's Chemical Manure Co.
Germany, 190 Anglo Cntntl. G. Works
" 5 J. Hall, junr.
Montreal, 300 Couper, Millar & Co.
Phosphate Rock
W. Indies, 464 t. G. M. Bauer
U. S. 2,511 Wyllie & Gordan
Montreal, 90 H. Hunter & Co.
" 160 Pickford & Winkfield

Naphtha—
Holland, 107 crbys. Lister & Biggs
" 38 dms. Burt, Boulton & Co.
Belgium, 18 Stein Bros.

Nickel Ore—
Sydney, 100 t. Fellows, Morton & Co.
France, 120 " "

Pitch—
U. S. 75 brls. W. Istead
Sweden, 50 G. Meyer & Co.
Spain, 117 R. H. Annison

Pyrites—
La Laja 100 t. G. Ward & Sons
Spain, 900 G. Tennant, Sons & Co.

Plumbago—
Ceylon, 75 cks. Threader, Son & Co.
E. Indies, 195 Sawer, Mead, & Co.
" 96 brls. L. & I. D. Jt. Co.
Germany, 24 cks. H. Lambert
" 63 Prop. Scott's Wf.
E. Indies, 385 Prop. Chmbln's. Wf.

Paraffin Wax—
U. S. 886 pks. H. Hill & Sons

Phosphate of Lime—
France, 115 t. A. Hunter & Co.

Potassium Carbonate—
Germany, 20 cks. M. L. Co.

Potash—
France, 40 pks. F. J. Putz & Co

Pearl Ashes—
France, 200 c. F. W. Berek & Co.
" 195 Petri Bros.

Stearine—
Belgium, 150 bgs. H. Hill & Sons
France, 101 sks. Beresford & Co.
U. S. 180 cks. A. A. Elliott

Sulphur Chloride—
Holland, £30 Kaul & Haenlein, Ltd

Saltpetre—
E. Indies, 829 bgs. C. Wimble & Co.
Germany, 118 cks. P. Hecker & Co.
" 78 J. Hall & Son
" 60 P. Hecker & Co.
E. Indies, 108 bls. L. & I. D. Jt. Co.

Sodium Acetate—
Belgium, 18 cks. A. Zumbeck & Co.

Sodium Hyposulphite—
Holland, £24 Taylor Sommerville & Co.

Sugar of Lead—
Germany, 3 pks. Spies, Bros. & Co.

Tar—
New Zealand, 6 brls. Chilworth Gunpowder Co.
N. Russia, 3,544 brls. 150½ brls. W. F. Malcolm & Co.

Turpentine—
U. S. 1,000 brls. Rose, Wilson & Co.
" 956 Nickoll & Knight

Tartars—
Italy, £2,400 Thames Steam Tug Co.
" 389 Fellows, Morton & Co.

Tartaric Acid—
Holland, 12 pks. W. C. Bacon & Co.
France, 8 B. & F. Wf. Co, Ltd.
Germany, 4 Q. Andrae & Co.

Ultramarine—
Holland, 5 pks. Haeffner, Hilpert & Co.
" 5 Phillipps & Graves
Germany, 7 cks. G. Steinhoff
" 8 H. Lambert
Holland, 5 cs. Hernu, Peron & Co.

Verdigris—
Germany, 1 ck. Skilbeck & Co

Zinc Oxide—
Germany, 2 cks. Girard frs. & Co.
Holland, 125 brls M. Ashley, Ltd.
" 200 " "

Zinc Ore—
Melbourne, 8 t. C. Davis
Italy, 6 c. Hughes, Chemery & Co.

LIVERPOOL.

Week ending Sept. 23rd.

Acetic Acid—
Rotterdam, 12 bskts.

Acids *(otherwise undescribed)*
Hamburg, 4 cs.

Alum—
Rotterdam, 41 cks.

Bones—
Para, a quantity. R. Gillies

Benzine—
New York, S. Banner & Co.

Copper Ore—
Lisbon, 196 t. Harrington & Co.

Cream of Tartar—
Rotterdam, 14 cks.
Tarragona, 3 Sachse & Klemm

Caoutchouc—
New York, 124 bls.
Manaos, 10 cs. R. Singlehurst & Co.
" 15 Bercher & Co.
" 25 W. Carden & Co.
" 58 C. Poley, Robert & Co.
" 606
Para, 882
" 173 F. Suarez & Co.
" 108 R. Singlehurst & Co.

Carbon—
Philadelphia, 140 bgs.

Chemicals *(otherwise undescribed)*
Huelva, 110 t. Hills & Co.
Malaga, 9 cs. E. Broughton & Co.

Dyestuffs—
Myrabolams
Bombay, 1,000 bgs. D. Sassoon & Co.
" 1,471
Logwood
Belize, 113 t.
Valonia
Smyrna, 50 t.
Yellow Berries
Constantinople, 149 bgs.
Divi divi
Hamburg, 386 bgs.
Argols
Brindisi, 15 cks. 94 sks. Mill & Co.
Bari, 72 bgs.
Bordeaux, 85 8 cks.
Extracts
New York, 67 bxs. 5 brls.

Glycerine—
Rouen, 23 pks. Co-op. Wholesale Society, Ltd.

Glucose—
Rouen, 5 cks. Co-op. Wholesale Society, Ltd.
Hamburg, 30 20 bgs.
Philadelphia, 50 brls. G. E. Bartot & Co.

Horn Piths—
Fray Bentos, 18 t. Liebeg's Ext. Meat Co.
B. Ayres, 26,400 Williamson, Milligan & Co.

Manganese Ore—
Gothenburg, 200 t. Macqueen Bros.
Portugal, 570 "

Naphtha—
New York, 750 brls. S. Banner & Co.

Potassium Muriate—
Hamburg, 2,046 bgs.

Pyrites—
Huelva, 1,726 t Matheson & Co.

Potash—
Rouen, 9 cs. 42 cks. Co-op. Wholesale Society Ltd.

Potassium Bichromate—
Alexandretta, 3 brls. Douck & Co.
Sodium Nitrate—
Iquique, 13,050 bgs. W. & J. Lockett
" 7,005 bgs. "
Salt—
Hamburg, 500 t
" a lot
Soap—
Boston, 2 cs. Barclay & Son
Marseilles, 6
Sulphur Flowers—
Marseilles, 10 brls.
Salammoniac—
Bordeaux, 3 cs.
Sulphur Ore—
Huelva, 820 t.
Soda—
Rotterdam, 100 kgs.
Tartar Emetic—
Hamburg, 8 cks.
Tartaric Acid—
Marseilles, 2 brls.
Rotterdam, 6 cks.
Tartar—
Bordeaux, 9 cks.
Ultramarine—
Rotterdam, 2 cks.
" 1 cs. 4 cks.
Verdigris—
Bordeaux, 2 cks.
Zinc Oxide—
Marseilles, 449 bgs.

GLASGOW.

Week ending September 25th.

Alum—
Rotterdam, 15 cks.
Acetate of Lime—
Montreal, 342 sks.
Bleaching Powder—
New York, 100 bxs. McGrady & Christie
Copper Ore—
Huelva, 1,545 t. Tharsis Co., Ld.
Carbon—
New York, 10 cs.
Chemicals *(otherwise undescribed)*
Hamburg, 2 cs.
Dyestuffs—
Extracts
Antwerp, 1 ck.
Glucose—
New York, 200 brls.
" 6
Gutta Percha—
Amsterdam, 199 bls.
Guano—
Christiania, 93 bgs.
Manure—
Phosphate Rock
Aruba, 322 t. A. Cros & Sons
Phosphate—
Antwerp, 250 t. 50 bgs.
Montreal, 205
Pyrites—
Huelva, 1,673 t. Tharsis Co.
Sulphur Ore—
Drontheim, 300 t.
Tartar—
Bordeaux, 5 cks.
" 6
Waste Salt—
Hamburg, 270 t.
Zinc Oxide—
New York, 20 brls.
Antwerp, 25
New York, 100
Rotterdam, 36 cks.

GOOLE.

Week ending Sept. 17th.

Caoutchouc—
Boulogne, 6 cks.
Dyestuffs—
Alizarine
Rotterdam, 25 cks.
" 8
Dyestuffs *(otherwise undescribed)*
Boulogne, 7 cs. 66 cks. 2 pks
Glucose—
Hamburg, 51 cks.
Dunkirk, 120 bgs.
Calais, 300
Potash—
Hamburg, 4 cks.
Potash—*continued.*
Dunkirk, 14 12 drs.
Calais, 10 brls. 80
Saltpetre—
Rotterdam, 100 bgs.
Soda—
Rotterdam, 10 cks.
Tartaric Acid—
Rotterdam, 4 cks.
Ultramarine—
Rotterdam, 4 cks.
Waste Salt—
Hamburg, 854 cks. 262 t.

HULL.

Week ending Sept. 25th.

Albumen—
Riga, 26 cs.
Acid *(otherwise undescribed)*
Rotterdam, 35 btls. W. & C. L. Ringrose
Alum—
Rotterdam, 14 cks. G. Lawson & Sons
Barytes—
Antwerp, 29 cks. Bailey & Leetham
" 41 H. F. Pudsey
Bremen, 23 Tudor & Son
Rotterdam, 23 Hutchinson & Son
Chemicals *(otherwise unaescribed)*
Antwerp, 54 pks. Wilson Sons & Co.
Hamburg, 56
" 1 Bailey & Leetham
Bremen, 2 cks. Veltmann & Co.
Rotterdam, 1 cs. G. Lawson & Sons
Dyestuffs—
Alizarine
Rotterdam, 6 cks. W. & C. L. Ringrose
" 30 Hutchinson & Son.
" 32 pks. W. & C. L. Ringrose
" 1 ck. Hutchinson & Son
" 12 1 cs.
" 26 W. & C. L. Ringrose
Ferro Chrome—
Rotterdam, 15 cs. Hutchinson & Son
Glucose—
Stettin, 1,200 bgs. C. M. Lofthouse & Co.
" 200 Wilson Sons & Co.
Manure—
Ghent, 203 t. Wilson Sons & Co.
Naphtha—
Rotterdam, 2 cks. Hutchinson & Son
Pitch—
Antwerp, 11 cks. H. F. Pudsey
Rotterdam, 44 brls. Hutchinson & Son
Phosphate—
Ghent, 203 t. Wilson Sons & Co.
Sulphur Ore—
Seville, 1,320 t.
Salt—
Hamburg, 4 cks.
Soda—
Rotterdam, 50 cks G. Lawson & Sons
Stearine—
Rotterdam, 40 bgs. Wilson Sons & Co.
Sulphur—
Rotterdam, 20 cs. G. Lawson & Son
Turpentine—
Savannah, 1,721 brls.
Tar—
Uleaborg, 1,316 brls.
Tartaric Acid—
Rotterdam, 6 cks. G. Lawson & Sons

GRIMSBY.

Week ending Sept. 20th.

Glucose—
Hamburg, 29 cks.
Manure—
Antwerp, 25 pks.

TYNE.

Week ending September 24th.

Barytes—
Antwerp, 61 brls. Tyne S S. Co.
Rotterdam, 21 cks. "
Glucose—
New York, 95 brls. Wholesale Co-op. Society
Hamburg, 5 cks. Tyne S. S. Co.
Phosphate—
Antwerp, 330 t. Langdale's Chem. Manure Co.
Sulphur Ore—
Pomaron, 1,200 t. Mason & Barry

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending September 17th.

Alum Cake—
Calcutta, 23 t. 7 c. 370 cks. £267
Ammonium Sulphate—
Rotterdam, 10 t. £115
Canaria, 2 26
Treport, 30 353
Hamburg, 200 2,400
Ammonium Carbonate—
Dunkirk, 18 c. £28
Danzig, 10 16
Hamburg, 3 t. 17 119
Bordeaux, 10 cks. 52
Acetic Acid—
Dunedin, 25 cs. £46
Acids *(otherwise undescribed)*
Cologne, 230 btls. £370
Cape Town, 12 cs. 36
Bisulphide of Carbon—
Rio de Janeiro, 2 t 19 c. £64
Benzoic Acid—
Hamburg, 2 cs. £32
Copper Sulphate—
Rotterdam, 10 t. £189
Cream of Tartar—
Montreal, 4 c. £20
Dunedin, 5 25
Adelaide, 1 t. 13 174
Caustic Soda—
Sydney, 8 t. 8 c. £98
Algoa Bay, 7 21
Cape Town, 3 15 109
Citric Acid—
Seville, 8 c. £58
Paris, 15 115
Hamburg, 1 keg 8
Lisbon, 5 cks. 39
Citric Acid—*continued.*
Algoa Bay, 10 c. 71
Rotterdam, 4 cks. 140
Santander, 2 66
Danzig, 1 kg. 8
Coal Products—
Pitch
Antwerp, 137 t. £181
" 140 230
Helsingfors, 250 337
Boston, 1,342 bls. 602
Antwerp, 131 174
Alexandria, 150 46
Cadiz, 185 287
Genoa, 1,991 2,986
Antwerp 152 201
Treport, 17 40
Alexandria, 100 30
Tar
Danzig, 500 250
Helsingfors, 700 322
Gothenburg, 100 rlls. 65
Rio de Janeiro, 100 50
Benzole
Rotterdam, 65 cks. £783
" 45 744
" 34 382
" 19 drs. 358
" 27 573
Treport, 10 pns. 170
Anthracene
Rotterdam, 119 cks. 837
" 65 434
Dusseldorf, 252 2,350
Cologne, 252 1,615
Dusseldorf, 60 471
" 61 334
Naphthaline
Bremen, 6 cks. 58
Le Treport, 11 13
Yokohama, 18 pks. 65
Coal Products—*continued.*
Naphtha
Melbourne, 30 drs. 69
Treport, 52 cks. 200
Dunedin, 10 13
Sydney, 25 60
Xylole
Rotterdam, 24 113
Alizarine
Boston, 15 225
Chemicals *(otherwise undescribed)*
Adelaide, 4 cs. £23
Sydney, 40 pks. 147
Disinfectants—
Hamburg, 50 cks. £300
Natal, 4 cs 20
Shanghai 400 gls. 30
Yokohama, 4 t. 18 c. 121
Ether—
Melbourne, 200 gls. £77
Manure—
Rouen, 44 t. £180
Jamaica, 15 160
Barbadoes, 375 10 c. 3,755
Lisbon, 19 14 101
Valencia, 50 9 390
Alicante, 202 3 1,500
Hamburg, 29 11 170
Denia, 450 1 3,600
Torrevija, 100 3 800
Madeira, 3 19 40
Orotava, 7 10 45
Nitric Acid—
Jersey, 24 crbys. £52
Phosphate—
Treport, 25 t. £186
Potassium Chlorate—
Hiogo, 5 t. £214
Yokohama, 300 kgs. 646
Hamburg. 10 c. 24
Yokohama, 200 428
New York, 100 227
Picric Acid—
Hong Kong, 2,000 lbs. £117
Sulphur—
Halifax, 8 c. £4
Salammoniac—
Paris, 1 t. 6 c. £45
Superphosphate—
Canaria, 3 t. £16
Sheep Dip—
Natal, 700 gls. £105
Cape Town, 12 t. 10 c. 600
Pt. Elizabeth, 18 15 900
Algoa Bay, 6 5 300
Dunedin, 3,000 gls 356
Soda Ash—
Sydney, 9 t. 16 c. £60
Saltpetre—
Rio de Janeiro, 4 t. 10 c. £101
Sydney, 5 110
P. Allegre, 2 4 54
Rio de Janeiro, 2 4 50
Lisbon, 4 1 67
Oporto, 3 14 75
Danzig, 1 23
Copenhagen, 1 16 39
Sodium Bicarbonate—
Auckland, 2 t. £13
Sulphuric Acid—
Singapore, 2 t. 10 c. £28
Karachi, 1,680 lbs. 28
Saltcake—
Helsingfors, 200 t. 3 c. £180
Tartaric Acid—
Dunedin, 2 c. £13
Adelaide, 10 71
" 1 t. 10 211
Melbourne, 5 31
Auckland, 6 43
Tannic Acid—
Yokohama, 2 c. £24

LIVERPOOL.

Week ending Sept. 20th.

Alkali—

Boston,	74 tcs.			
Leghorn,	2 cks.			

Ammonium Sulphate—

Gr. Canary,	10 t	3 c.	1 q.	£117
Rotterdam,	51			612
New York,	51	5		564

Ammonium Muriate—

Antwerp,		7 c.	1 q.	£9
Philadelphia,	17 t	4	1	388
Pittsburg,	6	4		137
Santander,		10		15

Ammonium Carbonate—

Genoa,	2 t.	2 c.		£69
Montreal,		10	2 q.	17
Barcelona,		4		6
Havre,	1	5	1	32
Montreal,	2			40

Antimony Regulus—

Rotterdam,	1 t.	£73

Alum—

Alexandria,	3 t.			£16
Batoum,	20	18 c.		112
Beyrout,	3	1	1 q.	16
Piræus,	4	15		25
Brisbane,		5	2	6
Galatz,	4	2	1	21
Ibrail,	51	8		268
Constantinople,	4	10		23
Smyrna,	3	1		16
Tripoli,	6	19		33
Valencia,	2	1		10
Havana,	7	10		37
Alexandria,	7	12		39
Sydney,	1	1	1	6

Borax—

Antwerp,	1 t.	12 c.		£44
Rotterdam,	5	8	1 q.	151

Brimstone—

Brisbane,	25 t	2 c.	£105

Boracic Acid—

Gijon,	3 t.	7 c.	2 q.	£101

Bleaching Powder—

Amsterdam,	12 cks.	
Antwerp,	30	
Barcelona,	10	
Boston,	176	
Copenhagen,		40 brls.
Genoa,	31	
Gothenburg,	5	
Hamburg,	85	
Montreal,		114 tcs.
New York,	10 bxs. 95	
Rotterdam,	28	
Rouen,	127	
Santander,	13 brls. 9	
Boston,	428	85
New York,	760	669

Caustic Soda—

Alexandria,	17 dms.	
Alicante,	3	
Amsterdam,	20	
Antwerp,	4	
Bahia,	2 brls.	
Barcelona,	148	
Batoum,	70	
Bilbao,	78	
Boston,	750	
Fairwater,	100	
Genoa,	39	
Gothenburg,	38	
Lisbon,	18	
Malaga,	50	
Malmo,	6	
Montreal, 50	50	50 pks.
New Orleans,	150	
New York, 160	30	
Odessa,	25	
Oporto,	152	
Otago,	6	
Pernambuco,	5	
Philadelphia,	135 brls.	254 dms.
Rotterdam,	75 dms.	
Rouen,	35	
Stettin,	40	
Yokohama,	100	
Amsterdam,	197	
Antwerp,	36	
Auckland,	9	
Barcelona,	224	110 cks.
Bari,	36	
Boston,	300	
Copenhagen,	105	
Corunna,	4	
Fairwater,	50	
Galatz,		100 kgs.
Genoa,	76	
Melbourne,	94	7 pks.
Messina,	16	
Naples,	16	
New York,	300	
Riga,	36	

Caustic Soda—*continued.*

Rotterdam,	18 dms.	
Tunis,	10	
Yokohama,	320	

Copperas—

Beyrout,	6 t.	6 c.	£13
San Francisco,	42		84
Piræus,	2	8	5
San Francisco,	19	3	43
Montreal,	3	13	8
Smyrna,	2	11	5

Caustic Potash—

St. Louis,	4 t.	6 c.	£90
Chicago,	1		22

Calcium Chloride—

Melbourne,	5 t.	2 c.	£10

Carbolic Acid—

Bombay,	13 t.	2 c.	1 q.	£157
Antwerp,			3	15
New York,	2	16	2	39
Rotterdam,		11		60
Rangoon,	5	4	1	73
Venice,		4	2	16

Copper Sulphate—

Rouen,	5 t.	13 c.		£102
Antwerp,	1	9	1 q.	25
Palermo,	1	3	2	21
Leghorn,	1	3		20
Genoa,	69	13	1	1377
Catania,	3	3		45
Palermo,	1			18
Naples,	1	4	3	21
Leghorn,	1	4	3	21
Genoa,	1	4		20
Venice,	4	15	3	85
Hamburg,		9	2	8
Catania,	1	10		22
Constantinople,		13		11
Copenhagen,	2			41
Genoa,	7			120
Galatz,		11	1	14
Ancona	32			586
Barcelona,	5			88
Hamburg,	5	2		90
,,		9		8
Rotterdam,	4	9		80
Odessa,	21	18		473
Seville,	15	6		283
Ibrail,	1			19
Odessa,	5			100
Bordeaux,	10			192
Bremerhaven,	5		1	92
Ancona,	55	8	1	988
Antwerp,	2	2	3	36
Bombay,	5			92
Bordeaux,	50	6	1	900
Danzig,	5		1	95
Ghent,	5		3	90
Halifax,	1	5		24
Melbourne,	10			1937
Nantes,	78	11		1410
Catania,	4	2		68
Genoa,	15	2	2	255
Bari,	1		2	18
Stettin,	4	19	2	95

Citric Acid—

Galveston,		2 c.	£16

Cobalt Oxide—

Gijon,		2 c.	£90

Disinfectants—

St. John's, N.F.,		7 cs.	£28
New York,		5 cks.	45

Dried Blood—

Montreal,	2 t.	14 c.	£30

Epsom Salts—

Rio de Janeiro,	100 kgs.	
Havana,	10 bls.	
Montreal,	25 brls.	

Gypsum—

New York,	10 t.	2 c.	£30

Glycerine—

Valparaiso,		1 c.	3 q.	£8
Ensenada,		13	1	38

Magnesia—

Rio de Janeiro,	50 cs.	

Manure—

Antwerp,	1 t.	4 c.		£24
Havre,	301	5		1556
Malaga,	49	10	2 q.	445
Las Palmas,	35			191

Magnesium Carbonate—

Vera Cruz,		2 c.	£6

Oxalic Acid—

Barcelona,		13 c.	2 q.	£23

Potassium Bichromate—

Boston,		15 c.	1 q.	£26
Aleppo,		7		12
Kobe,	3 t.	13	1	130

Pitch—

New York,	27 cks.	

Potassium Chlorate—

Hiogo,	10 t.		£466
Shanghai,	2	10 c.	105

Potassium Chlorate—*continued.*

Chicago,	2 t.	10 c.	£117
Galveston,	1		46
San Juan,	1	10	65
Copenhagen,	7	2	304
Hamburg,	2		93
Boston,	12	10	125
Hiogo,	15		704

Potash Crystals—

San Francisco,		3 c.	£20

Phosphate—

Valencia,	5 t.	4 c. 1 q.	£25

Potassium Prussiate—

Genoa,	2 t.	9 c. 3 q.	£214

Phosphorus—

B. Ayres,		19 c.	£165

Sodium Sulphate—

Wellington	5 t.	3 c.	£38

Sodium Chlorate—

New York,		10 c.	£30
Stettin,		2	6

Soap—

Akassa,	187 bxs.		
Ambriz,	50		
Axim,	20		
Barbadoes,	200		
Calcutta,	250 bdls.		
Cameroons,	50		
Cape Town,	590		
Copenhagen,	30 cks.	40	
Durban,	75		
E. London,	134		
Falmouth,	50		
Gibraltar,	1 bdl.		
Hong Kong,	400	10 cs.	
Kingston,	1	2,089	1
Lagos,		158	
Leghorn,	4 cks.	115	
Lisbon,			2
Little Popo,	20		
Loanda,	70		
Loanga,	30		
Malta,	40		
New York,	100		
Opobo,	3,100		
St. John's,	365	5	
Smyrna,		1	
Vancouver,	25		
Madras,		6	
Piræus,	40 bdls.		
Alexandria,		12	
Amsterdam,	200		
Barbadoes,	300		
Belize,	755		
Bombay,		74	
Carthagena,		2	
Colon,		1	
Curacao,	200		
E. London,		40	
Halifax,	50		
Harbour Grace,	10		
Jersey,	20		
Kingston,	90		
Loango,	30		
Mexico City,		1	
Nassau,	20		
New York,	3 cks.	33	
N'kombi,	20		
Piræus,		20	
Quilimane,		22	
St. Thomas,	300		
Teneriffe,	292		
Toronto,		100	

Sodium Bicarbonate—

Amsterdam,	6 cks.	10 kgs.	
Antwerp,	27		
Bremerhaven,	39		
B. Ayres,	80		
Calcutta,		500	
Danzig,		20	
Melbourne,		600	
Nagasaki,		200	
Odessa,		200	
Rotterdam,	2		
Stettin,		23	
Alexandretta,	2	6	
Alexandria,	50 brls.		
Alicante,		40	
B. Ayres,	39		
Calcutta,	25	250	
Christiania,		200	
Copenhagen,	5	80	
Halifax,		100	
Hamburg,		34	
Havre,		149	
Malmo,	16		
Marseilles,		130	
Montreal,		100	
Naples,		30	
Odessa,		20	
Paris,		112	
Piræus,		20	
Riga,		100	
Rotterdam,	20		
Stettin,		53	
Sydney,		230	

Sodium Bicarbonate—*continued.*

Valencia,		50 kgs.
Yokohama,		2,000

Salt—

Amsterdam,	100 t.		
Antwerp,	100		
Baltimore,	420		
Belize,	257		
Benguela,	12½		
Boston,	80		
Calcutta,	4,172		
Cape Coast,	25		
Cape Town,	50		
Cavally,	9		
Chicago,	455		
Galveston,	527		
Iceland,	80		
Lagos,	189	14 c.	
Manaos,	17	19	
Mauritius,	98		
Montreal,	467		
New Orleans,	200		
New York,	80		
Para,	18		
Rotterdam,	28		
Saltpond,			5
San Francisco,	278		
Sierra Leone,	100		
Svendborg,	200		
Trinidad,	49½		
Victoria,	80		
Wilmington,	398		
Cameroons,	165		6
Algoa Bay,	9		
Baltimore,	195		
Bonny,	45		5
Boston,	100		
Brass,	250		
Calcutta,	500		
,,	3,190		
Cape Coast,	6		5
Chicago,	210		
Drammen,	307		
E. London,	26		15
Gothenburg,	56		
Iceland,	90		
Landana,	7		
Melbourne,	257		
M. Video,	28		
Newfairwater,	100		
Old Calabar,	80		
Para,	55		
Port Natal,	5		
St. John,	1,800		
San Francisco,	135		5
Trinidad,	8		
Wilmington,	600		
Yokohama,	2		2

Soda Ash—

Baltimore,	237 cks.		
Boca,	41 brls.		
Boston,	800	32	
Leghorn,		15	
Lisbon,		3	
Montreal,			72 tcs.
New York,	760	669	
Philadelphia,	66	427	
Santos,	50		
Bahia,	10		
Barcelona,	140		
Boston,	82	66	
B. Ayres,	50	155	
Corfu,	100		
Genoa,	17		
New York,			1,350
Odessa,	100		
Oporto,	10		
Philadelphia,			161
Rio Grande do Sul,			80 brls.
Santander,	21		
Savanilla,	5		
Smyrna,	60		
Yokohama,	134		
Maranham,	105		

Soap Powder—

Sydney,	11 t.	13 c.	
Havre,	100 bxs.		

Soda Crystals—

Malta,	50 brls.		
Messina,	4		
Montreal,	16 cs.		
New Orleans,			84 cks.
New York,			225
Philadelphia,			280
Portland,	200		
Smyrna,	90		
Constantinople,	100		
Messina,			4
New York,			625
Sydney,	134 kgs.		

Sodium Silicate—

B. Ayres,	17 brls.	
Cienfuegos,	6	
Naples,	12	
Oporto,	10	
Vigo,	4	

Sodium Carbonate—
Antwerp, 40 brls.
Boston, 112
Montreal, 66
New York, 140

Superphosphate—
New Orleans 1,502 t. 4 c. 2 q. £3,755

Saltpetre—
Havana, 5 c. £6
Larnaca, 2 t. 10 55
Barcelona, 6 5 132

Salt Cake—
Baltimore, 106 t. 9 c. £252

Sodium Phosphate—
Pasages, 13 c. £13

Salammoniac—
Odessa, 1 t. 7 c. 2 q. £46
Piræus, 6 10
Ibrail, 12 21
Barcelona, 10 17
,, 1 3 5
Genoa, 10 18
Galatz, 1 16 51

Sodium Biborate—
Cardenas 4 c. £6
Antwerp, 5 t. 5 2 q. 158
Gijon, 7 8 115
Yokohama. 3 11 2 101
Hamburg, 6 7 190
Rio de Janeiro, 6 9

Sulphur—
Rouen, 20 t. 5 c. £85
Rangoon, 2 9
Maranham, 1 2 3 q. 7
New York, 19 19 90
Montreal, 2 10 3 18

Sodium Nitrate—
Almeria, 1 t. 1 q. £9
Carthagena, 6 9 c. 1 57
Venice, 6 7 1 52
Alicante, 3 15 33

Sheep Dip—
B. Ayres, 131 cs. £262
Montreal, 1 t. 3 c. 1 q. 46

Tar—
Gonavies, 4 brls.
St. John's, Nfld., 50
Harbour Grace, 12
Lagos, 20

TYNE.

Week ending Sept. 24th.

Ammonium Sulphate—
Hamburg, 20 t.

Alkali—
Abo, 16 t. 11 c.
St. Petersburg, 82 18
,, 37 7
Odense, 7 5
Christiania, 2 10
Newfairwater, 30 2
,, 10 8
Amsterdam, 37

Antimony—
Montreal, 3 t.
Rotterdam, 10 10 c.

Alum Cake—
Copenhagen, 6 t. 4 c.

Bleaching Powder—
Helsingfors, 54 t. 18 c.
Sornas, 39 18
Konigsberg, 5 3
,, 18 17
Lisbon, 10
Pasages, 20 18
St. Petersburg, 24 11
,, 192 5
,, 86 7
Odessa, 10
Riga, 48 19
Montreal, 25
Riga, 7 6
,, 30 1
Hamburg, 17 13
,, 18 1
Antwerp, 5
,, 9
Norrkoping, 5 3
Rouen, 5
Malmo. 16 13
Danzig, 143 19
Newfairwater, 46 1
,, 13 12
Amsterdam, 14 2
,, 8 5
Copenhagen, 20 6
Rotterdam, 3 6
,, 3 9
,, 12 4
Gothenburg, 20 7

Bones—
Rouen, 10 t. 6 c.

Barytes—
Rouen, 15 t.
St. Petersburg, 24 11 c.

Barytes Carbonate—
Rouen, 54 t.
New York, 25
Odessa, 10
Copenhagen 5

Barium Chloride—
New York, 1 t. 2 c.

Blanc Fixe—
Montreal, 5 t. 6 c.

Copperas—
Christiania, 3 t.
Helsingfors, 1 13 c.
Drontheim, 3 2
Montreal, 15

Caustic Soda—
Hamburg, 9 t. 17 c.
Antwerp, 2 q.
Norrkoping, 10 3
Rouen, 4 19
New York, 33 7
Ghent, 17
Gothenburg, 4 18
Stockholm, 22 17
Konigsberg, 1 9
Odessa, 68 14
Riga, 15 1
Montreal, 3
,, 17 8

Copper Sulphate—
Riga, 10 t. 16 c.

Gypsum—
New York, 91 t. 9 c.

Litharge—
Montreal, 10 c.
,, 5 t. 3
,, 2 10
Amsterdam, 1 2
Stockholm, 1 12
Riga, 3
,, 9 18

Magnesia—
Antwerp, 2 q.

Magnesium Carbonate—
Rotterdam, 6 c.

Naphthaline—
Rotterdam, 18 t. 14 c.

Pitch—
Danzig, 30 t.

Potassium Chlorate—
Odessa, 1 t.
Hamburg, 1 13 c.
New York, 11

Pitch—
Montreal, 85 t.

Soda—
Abo, 2 t. 3 c.
Montreal, 3
,, 16 6
,, 37 10
,, 17 10
,, 5
Norrkoping, 49 19
Aalborg, 5 12
Svendbuorg, 7 7
Rotterdam, 3 4
,, 11
Stockholm, 20 2
,, 5 18

Sulphur—
Gothenburg, 3 t.
,, 75

Sodium Sulphate—
Rotterdam, 10 t.
Abo, 15 9 c.
Helsingfors, 3 9

Soda Ash—
Gothenburg, 10 t. 3 c.
Abo, 11 11
Helsingfors, 92 2
Konigsberg, 11
,, 225 5
,, 30 15
Lisbon, 40 4
Montreal, 10 3
Riga, 20 4
Hamburg, 14 8
Odense, 8 12
Antwerp, 10 18
Gothenburg, 45 8
Christiania, 10
,, 3 3
,, 1 4
Danzig, 65 14
Newfairwater, 50 8
Norrkoping, 5 3

Sodium Nitrate—
Gothenburg, 1 t.

Sodium—
Hamburg, 2 cs.

Soda Crystals—
Aalborg, 12 t. 14 c.
Antwerp, 5 5

Salammoniac—
St. Petersburg, 5 t. 8 c.

Sodium Hyposulphite—
Montreal, 3 t.
,, 2 10 c.
,, 1

Soap—
Antwerp, 2 q.

Sodium Chlorate—
Hamburg, 1 t. 5 c.

Tar—
Odessa, 84 t. 16 c.
Danzig, 1,493 brls.
Riga, 10 t. 6
,, 150 brls.
Danzig, 150

HULL.

Week ending Sept. 23rd.

Alkali—
Copenhagen, 5 pks.
Stettin, 14 cks.
Riga, 54

Bleaching Powder—
Amsterdam, 8 cks.
Bombay, 30 drms.
Drontheim, 31

Borax—
Christiania, 2 cs.

Bone Size—
Harlingen 12 cks.
Rotterdam 1

Caustic Soda—
Antwerp, 24 drms.
Amsterdam, 36
Bombay, 50
Bergen, 4
Dunkirk, 18
Hoango, 1
Helsingfors, 37
Libau, 204
Riga, 660
Reval, 40
St. Petersburg, 100
Venice, 50
Wyburg, 120

Copper Sulphate—
Antwerp, 88 cks.
Bergen, 5
Christiania, 7

Chemicals *(otherwise undescribed)*
Antwerp, 8 cs.
Bremen, 10 cks.
Bombay, 2,380 26 pks.
Bergen, 5
Bordeaux, 30
Copenhagen, 1
Christiania, 2 1
Constantinople, 25
Drontheim, 102
Genoa, 23 2
Gothenburg, 10 23
Ghent, 10
Helsingfors, 5
Hamburg, 25 120
Kurrachee, 343
Leghorn, 6
Libau, 100
Lisbon, 3
Marseilles, 3
Norrkoping, 10
Naples, 10 10
Odessa, 418
Palermo, 1 1
Rouen, 24
Rotterdam, 20 7 24
Riga, 106
Reval, 5 5
Stettin, 4 43
St. Petersburg, 40
Wyburg, 9 60

Dyestuffs *(otherwise undescribed)*
Antwerp, 5 cks.
Hamburg, 12 1 cs. 3 drms.
Kurrachee, 20
Rotterdam. 5 2 kgs. 1 2
Reval, 10
Stettin, 180 bgs.

Manure—
Stettin, 100 bgs.

Naphtha—
Copenhagen, 14 cks.

Pitch—
Antwerp, 125 t.
Bombay, 125
Leghorn, 201
Venice, 150

Sulphur—
Christiania, 50 t.

Soap—
Gothenburg, 5 cs.
Stavanger, 10

Turpentine—
Constantinople, 10 cks.

Tar—
Bombay, 125
Fiume, 10
Hamburg. 5
Kurrachee, 61

GRIMSBY.

Week ending September 20th.

Coal Products—
Dieppe, 1 ck.

Chemicals *(otherwise undescribed)*
Hamburg, 2 cs. 5 cks.

GOOLE.

Week ending Sept. 17th.

Bleaching Preparations—
Ghent, 54 cks.
Rotterdam, 28
Hamburg, 28

Benzole—
Dunkirk, 50 cks.
Hamburg, 12 drms.
Rotterdam, 18 99 cks.

Coal Products—
Rotterdam, 474 cks.

Chemicals *(otherwise undescribed)*
Calais 10 tcs.
Hamburg. 68 cks.

Dyestuffs *(otherwise undescribed)*
Boulogne, 4 cs. 17 cks.

Manure—
Boulogne, 50 bgs.
Hamburg, 367

Pitch—
Antwerp, 70 t.

GLASGOW.

Week ending September 25th.

Ammonium Sulphate—
Philadelphia, 63 t. 5 c. £685

Ammonia—
Hong Kong, 1 t. 8½ c. £45
B. Ayres, 2 3 52

Benzole—
Amsterdam, 7 drms. £150

Bleaching Powder—
Melbourne, 6 t. £38

Dyestuffs—
Logwood
Oporto, 11¼ t. £90
Montreal, 224¾ c. 120

Epsom Salts—
Christiania, 50 css. £20

Potassium Bichromate—
Gothenburg, 10 t. 6 c. £302
Calcutta, 1 11 47
Melbourne, 38¾ 79
Amsterdam, 23 cks. 256
,, 68 756

Paraffin Wax—
Montreal, 226 c. £340
Japan, 553 835
,, 6 t. 19¼ 194

Potassium Chloride—
Bilbao, £50

Potassium Prussiate—
New York, 5 t. 7¾ c. £423

Pitch—
Christiania, 43 brls. £15

Soda Ash—
B. Ayres, 1,283 c. £452

Sodium Phosphate—
Rouen, 1 t. 10 c. £56

Sodium Bichromate—
Amsterdam, 2 cks. £25
,, 2 13
Gothenburg, 1 t. 9 c. £30

PRICES CURRENT.

WEDNESDAY, October , 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	57/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	1	0
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	6	6
,, (free from arsenic, 140/145°) .. .. ,,	1	10	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	10	0
Aniline Oil (pure) .. .. per lb.	0	0	11½
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	5	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	3
,, 50/90 ,, ... ,,	0	3	3
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¾
,, (crude 60°) .. .. per gallon	0	1	8
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	59	10	0
,, Sulphate .. .. ,,	19	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	15	0
,, Litharge Flake (ex ship) .. .. ,,	15	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	5	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	3
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	26	0	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5⅓
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5¼
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	3½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	2	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, ... ,,	12	15	0
,, ,, (70 % Caustic Soda) ,, ... ,,	11	12	6
,, ,, (60 % Caustic Soda) .. .. ,,	10	12	6
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	10	0
,, Bicarbonate .. .. ,,	6	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	104	0	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	25	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	7	6

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PRICES CURRENT.

WEDNESDAY, OCTOBER , 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	57/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	1	0
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	6	6
,, (free from arsenic, 140/145°) .. .. ,,	1	10	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	10	0
Aniline Oil (pure) .. .. per lb.	0	0	11½
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	5	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	3
,, 50/90 ,, ... ,,	0	3	3
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¾
,, (crude 60°) .. .. per gallon	0	1	8
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	59	10	0
,, Sulphate .. .. ,,	19	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	15	0
,, Litharge Flake (ex ship) .. .. ,,	15	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	5	0
,, Carbonate (white lead) pure .. .. .. ,,	19	0	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	5	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	3
Oils:—			
Cotton-seed .. .. per ton	21	10	0
Linseed .. .. ,,	26	0	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton.	20	0	0
,, Chlorate .. .. per lb.	0	0	5¼
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	4	2	6
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	3½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	0	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	2	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	15	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	12	6
,, ,, (60 % Caustic Soda) .. .. ,,	10	12	6
,, ,, (60 % Caustic Soda, cream) (f.o b.) ,,	9	10	0
,, Bicarbonate .. .. ,,	6	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	28	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	104	0	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	25	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	7	6

THE

CHEMICAL TRADE JOURNAL.

Publishing Offices: 32, *BLACKFRIARS STREET, MANCHESTER.*

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The combustion of coal as a theoretical study is no doubt very well understood in many quarters, but judging from the large number of senseless and absurd patents that are taken out from time to time, there are evidences that the theoretical

study of combustion is often sorely neglected. One would think, that whether coal was cheap or dear, the user of it would endeavour to utilize the utmost amount of heat it is capable of giving out, but in practice we find this is not so, and in most coal burning departments the utmost waste and extravagance prevails.

Most coal users know fully well that the ordinary quality of steam raising coal will theoretically evaporate from 12 to 14 lbs. of water per lb. of fuel reckoned from 212 degrees ahrenheit, yet it is very rare that one meets with an evaporative efficiency of more than 7 lbs., even with boilers of good construction and setting.

It is also well known that in several exhibitions, well-known boilers, such as those of Messrs. Galloway, have evaporated as much as 11·8 lbs. of water from 212 F. per lb. of fuel, yet, when these same boilers are employed in ordinary practice, a much smaller duty is obtained. It is our object this evening to show how this comes about, but first of all it is necessary to show how, in ordinary combustion, smoke is produced, its composition, and the deleterious nature of its constituent or component parts.

Combustible substances ignite and burn at very varying temperatures. If I take some petroleum spirit, you will see that the mere application for an instant of a naked flame causes immediate ignition.

1. (Experiment on petroleum spirit.)

If, however, we treat ordinary paraffin oil in the same way, the liquid will actually extinguish the flame of the taper, instead of taking fire, as in the case of the petroleum spirit.

2. (Experiment with paraffin oil.)

If I now heat the paraffin oil, ignition takes place more easily, as you will see.

3. (Experiment by heating the oil.)

We may next endeavour to ignite a mixture of these two liquids when you will observe that the high inflammability of the one aids the apparent indifference of the other.

4. (Experiment on mixed liquids.)

You will also have observed, no doubt, that the paraffin oil did not burn with such a smoky flame as the petroleum spirit, and if I now show you the combustion of a liquid containing more carbon, such as benzene obtained from the dry distillation of coal, you will find that the flame is even more smoky than that of the petroleum spirit.

5. (The combustion of benzene.)

Solids generally, especially those of a semi-mineral nature, require considerably higher temperatures to start the ignition, and this is easily demonstrated by the application of heat to anthracite and graphite.

6. (Anthracite ignition.)

7. (Graphite ignition.)

In the instances I have already shown you, viz :—The ignition of several liquids, the formation of smoke can be readily avoided by the proper regulation of the air supply, and the mainteinance of the temperature of combustion. It would be rather difficult without the aid of expensive apparatus to show you this in a satisfactory manner, but by using ordinary coal gas, it can be readily exhibited.

8. (Bunsen's burner and Wanzer lamp.)

It will thus be seen that even with the most readily combustible substances, at least two conditions are necessary to avoid the production of smoke. The first is to ensure a proper adjustment of the combustible body and air, while the second is to maintain the flame temperature until the combustion has been completed.

These instructions appear very simple, but the carrying of them out on the large scale is by no means such an elementary problem as at first sight appears. We have principally to deal with the combustion of coal and that often not of the best quality. We will try the application of heat to it.

9. (Ignition of Coal by Bunsen and Batswing).

The first application of heat to coal results in the volatilisation of the more volatile products, leaving behind the more fixed portion, or what is generally termed coke. This is what takes place when coal is thrown on a red-hot fire, either in a factory furnace or in a domestic fire-place, forming pulsations so to speak, in the combustion process, the emission of smoke being coincident with the commencement of each pulsation.

Roughly,—but quite near enough for all practical purposes,—one third of the component parts of coal may be taken as being volatile under the application of a moderate degree of heat, and two-thirds remain fixed and only burn and pass off as gaseous products with the air supply properly maintained.

Now it is well known that when ordinary fuel is charged into a red-hot furnace, the distillation process occupies but a few minutes, and in that few minutes one-third of the weight of the coal charged in is driven off, while the air supply is tolerably constant, in fact, the large gaseous volume suddenly generated by the distillation of the coal must certainly check the in-flow of air at a moment when more is required.

Moreover, the gaseous portion of coal requires considerably more air for complete combustion per unit of weight than does the fixed portion. An example will perhaps illustrate the matter more clearly :—

An ordinary 30 by 7 Lancashire boiler is usually made to burn rather more than 40 tons of coal per week of 132 hours; this amounts to 690 lbs. per hour, or 23 lbs. per square foot of grate area per hour reckoning 30 square feet as the area of the grates.

Working under good practical conditions, 220 cubic feet of air will be consumed per lb. of coal, so that every hour will see brought into the fire-places $690 \times 220 = 151{,}800$ cubic feet of air, which is 12,650 cubic feet every five minutes. We will suppose now that the fireman fires the furnaces every half-hour, and that he does—what I have very often seen done—viz., fire both furnaces of the boiler together. In this case 3 cwts. of coal will have to be thrown on each furnace every half-hour. Of this three hundredweights we have already seen that one-third is volatile and quickly driven off as combustible gas. It may be stated as being accurate enough for all practical purposes that this one-third will be evolved in five minutes, and that the residual two-thirds burn off in the remaining twenty-five. Approximately then, one hundredweight of the gaseous portion is supplied with 12,650 cubic feet of air, and the two hundredweights of fixed fuel with 63,250 cubic feet. This calculated per pound of fuel is 113 cubic feet per pound for the gaseous portion, and 282 cubic feet for the fixed.

I am now speaking of an ordinary boiler, fired by hand and looked after in the best manner, and not overworked; the evil becomes much intensified when more than 40 tons of coal per week is burned under a single boiler. The gaseous portion of the fuel requires far more air per unit of weight than the fixed, yet in practice the reverse is actually obtained. This weak point has been observed and partially corrected by several inventors.

It is not my intention this evening to act as an advertising agent for those enterprising men who have endeavoured to solve the smoke problem. Most of them have been invited to attend here this evening, and to exhibit models or drawings or appliances of any special kind they may have designed for lessening or preventing smoke, and no doubt they will be able to explain to you such special apparatus much better than I can do.

My desire is to set forth, in as clear a manner as I possibly can, the broad principles which underlie the problem, so that smoke producers may not spend their capital unprofitably when they endeavour to make a change.

Returning now to our remarks upon air supply, the extra requirements of air at the period when coal is newly charged onto the fires has long been catered for by many inventors. Every one who has written or spoken on the smoke question has for many years quoted Mr. C. Wye Williams, and the Parkes split bridge. The air bridge has been adapted to

many boilers, but after a few days use they are generally inefficient, having in a short space of time become choked up with ashes and flue dust. Moreover, in the hand-fired boiler the extra air is only needed when the volatile products are being so rapidly evolved from the coal; at other times, excess of air is decidedly injurious. It may be urged that most of these air bridges have dampers to open or close them; this is granted, but all I have seen without exception were, when examined, so clogged with flue dust, as to be immovable either one way or the other.

Appliances to admit air to the furnace for so many minutes after firing, self-closing after that period, have been devised by several inventors, and are at work in a few mills to my knowledge; that is to say, they are fitted to the furnace doors, more than this I would not care to vouch for.

The official report of the London Smoke Abatement Exhibition, of 1882, contains descriptions of several appliances devised to give more air at the time immediately after firing. Hollow bridges, hollow bars, superheating chambers, and balanced doors, all provided to give more air.

What I wish to point out now is that too much air may be given.

In a well fired boiler, stoking by hand, the excess oxygen should not exceed 6·5% by volume in the products of combustion, when the sample of gas is taken over a long period, say two hours; whereas, in a boiler flue I once examined, the furnaces to which were fitted with split bridges and self-closing louvre doors, the excess oxygen amounted to 13·2%, showing a great loss of heat by the chimney.

It needs specially to be observed that those inventors who have laboured to introduce excess air to the furnaces during the period immediately after firing were under normal and well defined conditions working in the right direction.

Those conditions were hand firing, and burning say 13 lbs. of coal per square foot of grate surface per hour; but 40 tons of coal per week means 23 lbs. per square foot of grate surface per hour when applied to an ordinary Lancashire steam boiler, and now-a-days a combustion of 36 lbs. per square foot of grate surface per hour is by no means uncommon.

The first limit of coal consumption is very seldom exceeded in the tests made at Smoke Abatement Exhibitions, and hence their uselessness. A very indifferent stoker can prevent visible-smoke when burning coal at the rate of 13 lbs. per square foot of grate surface per hour; it becomes much more difficult at 23 lbs, while at 36 lbs. smoke prevention is almost impossible even with the aid of all the legion of smoke preventing appliances, save mechanical stokers.

The method of testing coals at the Smoke Abatement Exhibition, of 1882, will show us what the engineer of that exhibition imagined to be the proper rate of combustion: on page 141 of that report, the Welsh steam coals were burned at the rate of 8·68 lbs. per square foot of grate area per hour; Nixon's navigation coal, 11·82 lbs.; Northumberland steam coal, 16·73 lbs. and 20·87 lbs.; and artificial fuel, 11·26 lbs.

Complete combustion can only take place when the combustion temperature is maintained; any influence which tends to lower the temperature, within certain limits, tends also to retard combustion. Time is also a material element, so that when the firing is excessive the partly burned gases are hurried out of the hot fireplace and brought into contact with the comparatively cool boiler-plates, thus causing smoke. In an ordinary boiler, burning 23 lbs. of coal per square foot of grate surface per hour, the furnaces have each but a capacity of 21 cubic feet, and as this quantity of air is admitted every second of time, the high pressure of the operation goes without saying.

But the air enters say at a temperature of 70° F. and before it leaves the furnace, or thereabouts, has become expanded to at least four times its original volume, so that not only has the temperature of 2000° F. to be attained in the fourth part of a second, but the space in the furnace above the grate bars must be filled and emptied four times in each second. I have never seen the problem put in this way before, and it will furnish all coal consumers with much food for reflection, and it will also serve to impress upon inventors the necessity of the time element, as against the admission of air only.

Having now shown the necessity of time and the maintenance of the temperature of combustion as applied to hand firing, we may turn our attention to other means that have been designed to overcome some of the difficulties I have already pointed out.

It will naturally have occured to you at this stage to enquire whether the distillation of the coal into one-third gas and two-thirds fixed coke could not be carried on simultaneously with the combustion of both of them, in fixed and regular quantities, so as to avoid the pulsations already spoken of as smoke-pulsations, and to avoid also the irregularity of the air supply, so detrimental to perfect combustion.

This brings us to another stage of the enquiry.

If the coal necessary for any required degree of combustion could be dusted on to the white-hot fire in a continuous stream, and in the exact ratio required for complete combustion, everything would go well until the capacity of the furnace for complete combustion is over-stepped. Many inventors have endeavoured to accomplish this and many have succeeded in producing very good specimens of what are now known as mechanical stokers.

There is not time to go into the details of these appliances in the short space of an evening lecture, but as I have already said, the makers of many of these things have been invited to be present to-night, so that no doubt they will be pleased to explain their contrivances to you.

What I have set myself to do, is, to bring before you what are considered by many the strong and weak points of mechanical stokers as applied in practice.

The first remark must be a general one, and the good old engineering maxim, that "no machine is stronger than its weakest part" bears upon it.

Break-downs have sounded the death knell of many a mechanical stoker, and in many instances blame has been cast upon the principle of stoking mechanically, when it ought to have been thrown on the constructive engineer; but experience begets perfection, and the lessons of the past have not been disregarded by the inventor of to-day.

The many mechanical stokers are all of them capable instruments in the hands of an ordinary fireman. They feed in the coal regularly, most of them break up and discharge the clinkers, and all of them when not worked beyond their capacity, give a chimney absolutely free from visible smoke.

If the foregoing statements be true, and it must be admitted they are, why is it that the mechanical stoker is not universally adopted? There are several reasons—the first, that many steam users grudge the extra outlay on the boilers is sadly too true. Secondly, many have been led to expect a large per cent. saving in £. s. d., which has not perhaps been realised, and the knowledge of this has led their friends to hesitate in adopting the invention, but, anyhow, the gain is to the public in having a less-contaminated atmosphere, and fewer smoke-begrimed buildings to disgrace our public walks.

I am of opinion that a well-arranged mechanical stoker will always show a better utilisation of heat units from the coal over even the most perfect hand-firing, but *cæteris paribus* the difference is not always so appreciable as some inventors would have us believe.

The greatest drawback, however, to mechanical stoking is the fluctuating requirements of the steam user.

In mills merely running a steam-engine, mechanical stokers will act admirably, but in the case of bleach-works, paper-mills, or chemical works and such like establishments, where a small and regular supply is required for several hours together, and then suddenly, and without warning, the whole steam-raising power is brought into requisition, the mechanical stoker is not suited, unless it be specially arranged.

There is no insuperable difficulty in this, but it is a noteworthy fact that these little arrangements are often not thought of inside the works where they are required until suggested by an outsider. In one works in which all the boilers were so well provided with mechanical stokers that one could not tell whether the factory was in operation or not by a mere inspection of the chimney top; the steam

required in large volumes intermittently brought down the pressure in the mains to near 7 lb. per square inch, so that some plant in which I was interested, was brought to a standstill. Some of the workmen began at once to argue against the efficiency of mechanical stokers, not realising the fact that the stokers were blameless; but this was soon put right by detaching a boiler from the set, for high pressure duty, which of course overcame the supposed evil.

A well-proportioned and carefully-fired Lancashire boiler, whether manipulated by hand or by a mechanical stoker, should allow of the transfer of not less than 80 per cent. of the theoretical heat of the coal to the water when an economiser is used in connection therewith; the heat lost by the chimney gases should not exceed 10 per cent,, nor should the loss by unburned carbon in the ashes exceed 2½ per cent.

As I have many times publicly pointed out, the smoke difficulty lies in a nutshell. If the boilers are carefully hand fired and the coal is burned quietly, say at a rate not exceeding 12 lbs. per square foot of grate surface per hour, and with an air supply produced by a chimney draught equal to 220 cubic feet at 62 F. per lb. of fuel, there will be no visible smoke. As we increase the quantity of coal per unit of time over a given area, so we increase the density of the smoke shade, until, when all restraint is removed, smoke of Stygean blackness is constantly emitted.

The case I have already put before you, in which the steam pressure in the mains became reduced to 7 lbs., is not a matter that could be allowed to happen in every works, and it is doubtful whether it was an economical proceeding in the factory where it was wont to happen. It is, however, not an uncommon occurrence, and is a fault that has been considered by the makers of nearly all the mechanical stokers, so that most of these appliances are now provided with independent firing doors, that when a sudden call is made for a large volume of steam, that call may be met by extra hand firing.

Here lies the secret of smoke production where there is a mechanical stoker. A boiler furnace already fired to its full capacity is perhaps suddenly made to burn three times as much fuel as when it was working smokeless, and perhaps with the same supply of air by the chimney; but even suppose that an increased ratio of air be supplied it would then mean that the furnace would have to be filled and emptied of its gaseous contents no less than twelve times in every second.

If this extra firing is not done, what is the result? Steam down, kiers idle, and the workmen affected, engaged in those saintly exhortations so characteristic of the workman of to-day.

I would not have you to suppose that the mechanical stoker is the only appliance devised to secure freedom from smoke.

The mechanical stoker cannot properly be called a smoke consumer. It is simply an apparatus to feed the fuel into the furnace in a continuous and scientific manner, and to give easy access to the air supply, by breaking up the clinker, causing it to leave the fire-bars; it allows of an almost perfect regulation of the air supply, so that much larger quantities of coal may be burned on a given grate area without smoke being produced.

There is a range of boilers working in Liverpool to-day fitted with a well-known mechanical stoker, each boiler burning 1,120 lbs. of coal per hour without producing smoke. Why, then, should visible smoke be allowed in our Northern towns?

At this point, some of our steam-using friends may be tempted to enquire respecting the merits of undergrate blowers.

Now it is a well-known fact that less air is required for combustion per lb. of fuel burned when the air is forced into the furnace than when the products of combustion are simply withdrawn by the chimney draught, and it is possible that some day steam users will settle down to the mechanical stoker, combined with an undergrate blower, as the orthodox method of steam raising.

In the Permanent Chemical Exhibition you will see drawing of a system of undergrate blowers of which I happen to know the details of a recent installation.

Up to the date of the change the boiler was fired with ordinary boiler slack at 12s. 6d. per ton, divided in quantity equal to, say, $45x$ tons, producing y volumes of steam. With the undergrate blowers y volumes of steam are now produced by the combustion of $44x$ tons of dross, costing 3s. per ton, and with the advantage of a smokeless chimney.

The earliest patent for steam raising, in which the prevention of smoke was considered, was taken out by James Watt in the year 1785—just 105 years ago. Have we made any advance in the matter during these 105 years? When I look round the neighbourhood of all large manufacturing towns and see the clouds of black smoke issuing from the chimneys, when I observe the smoke-begrimed buildings in our city streets, I am tempted to think that if our forefathers were worse off than we are now, the "good old times" must have been rare old times indeed.

We may now turn our attention to another system by means of which coal may be burnt smokelessly, that is, by first converting it into gas.

All of you have heard, no doubt, of water-gas; well, no one would think of firing steam boilers with water-gas, but what is called "producer-gas" may often be, and is, so employed.

Producer-gas is a by-product, so to speak, of water-gas, but it is also produced as a substantive product in the Siemens, Dowson, or Wilson producers. It is very easy to burn this gas without producing smoke, but though some few have stated that there is a pecuniary advantage in using it, yet I believe that this is so only under special conditions, and under special circumstances.

Producer-gas must not be confounded, in any way, with coal-gas as we ordinarily know it. The heating powers of the two are very different and must be duly considered.

One lb. of coal-gas will give out 12,233 units of heat, while a pound of the best producer-gas will give out but 1,000 units.

To put it more plainly, 12 lbs. of producer-gas will not do more heating than 1 lb. of coal-gas, even when the producers and the combustion are well managed, while if they are badly managed, gaseous fuel may become a very expensive luxury indeed.

Producer-gas is, bulk for bulk, nearly twice the weight of coal-gas, so that 6,000 cubic feet of Dowson gas are only equal to 1,000 cubic feet of coal-gas, and if, as stated, Dowson gas can be made for four-pence per 1,000 cubic feet, this is equal to using coal-gas at two shillings.

The tests made at the Smoke Abatement Exhibition of 1882 with this gas, as compared with coal-gas, show a ratio of 4·17 to 1·0, but I am inclined to the opinion that this is to favourable for general practice.

The industrial application of gaseous fuel seems inclined to receive a fresh impetus through the introduction of Mr. Mond's patented process, in which ammonia is recovered from the products of combustion or rather from the products of the gasification.

We may now turn our attention to the composition of the gaseous products of combustion, from ordinary coal and coke.

The gases from the flues of a carefully-fired Lancashire boiler, not overworked, may be stated as:—

Carbonic acid	10·4
Carbonic oxide	Nil.
Oxygen	6·4
Nitrogen, Sulphurous acid, &c.	83·2
	100·0

The amount of soot passing away by the chimney, averages about six grains in the 100 cubic feet of gases, and the sulphurous acid of the smoke averages, with good coal, 0·8 grain per cubic foot.

This sulphurous acid is an invisible gas, suffocating in its nature to animals, and most destructive to vegetation. It diffuses into the atmosphere, dissolves in the rain, the dews and the mists; it oxidises into sulphuric acid or oil of vitriol, and does far more damage in its new guise than in its old form; it permeates and rots our picture cords and window-curtains, the sash-cords of our windows, and the leather bindings of our libraries, spreading destruction around with a very lavish hand.

The deleterious nature of the sulphurous acid contained in the products of combustion from ordinary coal has not been sufficiently recognised by those reformers who have sought to ameliorate our atmospheric conditions.

The sulphurous acid of coal smoke is a far greater evil than that of the black or visible portion, yet it is the black or visible portion that is usually attacked as being the author of so much mischief.

10. (Influence of SO_2 on colours.)

Many recent writers on the smoke question have endeavoured to prove that if smoke is totally suppressed much injury will arise from the formation of carbonic oxide; a very deadly gas.

This argument is totally without foundation, in fact it is false in the extreme, and in a well fired boiler to which sufficient air is carefully admitted, there is no carbonic oxide whatever to be found in the flue gases.

Time is progressing—I think I have already said enough to show that, with proper means, visible smoke will in all cases be prevented.

If steam users will persist in firing their boilers intermittently by hand, they must be satisfied with burning only as much coal as will produce a smokeless chimney; if they desire to press their boilers harder, I have already pointed out the remedy—the mechanical stoker.

So far, I have only considered the smoke arising from steam production, but furnaces of many other kinds also produce smoke.

It is not my intention this evening to enter upon such a vast and varied field, it will be better to leave this for a future lecture, but it may be as well to say that in all cases smoke can be avoided without expense if the producers of it will only put their shoulders to the wheel in the right way.

There is only one thing left to consider, and that is the sulphurous acid of the smoke, so long neglected, and so baneful in its effects. How is it to be suppressed?

Efforts have been made, however, to overcome the nuisance and injury arising from the sulphurous emanations from boiler smoke.

At the Manchester Smoke Abatement Exhibition of 1882, Mr. Benjamin Goodfellow, of Hyde, exhibited the model of a machine, then in operation at his works, washing the smoke from two of his boilers.

A drawing of this apparatus may be seen in the Exhibition room.

We asked Mr. Goodfellow if he would be good enough to lend us the model for the purposes of this lecture, but we learned from him that it had been, unfortunately, broken up. We have learned from him, however, that when water was used in the apparatus alone, that 75% to 80% of the sulphurous acid was removed, while when soda or lime was employed the whole of the sulphurous acid was absorbed.

Mr. Goodfellow says, most pertinently, "The chief advantages which this machine possesses is that it deals with the poisonous part of the smoke, which is *acid*."

I do not know what has become of this machine, whether it is still in use at Hyde, or whether it has been consigned to the limbo of forgotten things. Perhaps if Mr. Goodfellow is here to-night he will be able to tell us.

The Porion spray chamber is also a very good smoke washer.

It has been designed by us as a smoke washer as early as 1877, and it answers this purpose admirably, far better than any ordinary condenser.

PERMANENT CHEMICAL EXHIBITION.

VISITORS are admitted without charge; they are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., Ld., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool. — Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Ld., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Ld., Buckley.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

Chadderton Iron Works Co., Ld., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co., Ld., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne. — Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant—Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester. — Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, Plaistow, Essex. — Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-Ammoniated Lime, &c.

Galloways, Limited, Manchester. — Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co., Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters.

Joseph Kershaw and Co., Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet. Makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester. — Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Marple Chemical Co.—Improved Iron Carboy Hampers.

Meldrum Bros., Manchester. — Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.— Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water-Softening Apparatus.

THE MOST VOLATILE CONSTITUENTS OF COAL-TAR.

IN their investigations of the most volatile portions of coal-tar, authors have hitherto employed the runnings obtained by the distillation of benzene hydrocarbons which have been subjected to a preliminary treatment with acids and alkalies. On this account a number of substances present in the crude material have escaped identification, owing to their removal by this treatment, whilst new bodies formed by the action of acids and alkalies have been isolated which could not be detected in the raw material, and it is doubtlessly owing to this circumstance that conflicting statements have been published regarding the presence or absence of a number of substances in the most volatile portions of coal-tar. The author therefore thought it desirable to employ unrefined benzene hydrocarbons for the purpose of this investigation, special attention being also given to the quantitative determination of the more important constituents by simple and accurate methods. At first the portion of English 90 per cent. benezne boiling between 30° and 80° was used, of which about 1·5 per cent. was obtained. Subsequently the fractions boiling between 50°-60° and 60°-70° were chosen, the necessary material being obtained from Haussermann, of the Griessheim Chemical Works, and the fractions being marked L 1 and L 2 respectively. They form colourless mobile strongly refractive liquids (assuming a yellow colour on standing), and possess a disagreeable penetrating odour which causes headache and slight giddiness after prolonged inhalation. The taste is caustic. Blue litmus paper is turned red. They burn with a luminous smoky flame which gives off a disagreeable odour. All attempts to isolate the different constituents by fractional distillation were unsuccessful; thus the fraction L 1, which gave about 66 per cent. between 50° and 60°, began to boil at 40°, and left a considerable residue boiling above 60°, and although after several fractionations it was possible to gradually concentrate the carbon disulphide in the portion boiling below 50°, the results were by no means satisfactory, as this end could only be achieved at the expense of the higher boiling portion. It would, in fact, seem as if it were not merely some peculiar property brought about by the process of fractional distillation which gives rise to this anomaly, but as if during the distillation the mixture suffered decomposition, forming new substances which considerably influence the boiling point. The author therefore tried the following methods: He attempted to remove by some means the bodies known to be present and then searched for new substances, and in a second series of experiments he made a number of tests to detect the presence or absence of certain hydrocarbon series by means of well-known group reagents.

1. Carbon disulphide was first obtained by Vincent and Delachanal from the low boiling portions of unrefined benzene. Its presence completely masks the results obtained by fractional distillation, and as acids and alkalies fail to remove it, commercial benzenes are almost invariably contaminated therewith. For the quantitative determination, Hofmann's process was tried. This is based on the formation of a well crystallized red additive compound when carbon disulphide is brought in contact with triethylphosphine. The author used pure carbon disulphide boiling at 46·8°, but failed to obtain satisfactory results, although he is unable to explain the cause of this. The numbers were invariably too low. He then tried the xanthic acid reaction. For this purpose, a measured quantity of carbon disulphide or liquid containing the latter is added gradually to an alcoholic solution of potash, when potassium xanthate is formed. The amount of the latter is then estimated as cupric xanthate, by adding a decinormal solution of cupric sulphate until there is a slight excess of the copper salt, which is ascertained by placing a drop of the solution from time to time on a double filter paper, and testing the liquid on the lower paper with potassium ferrocyanide. One cc. of the copper solution is equal to 0·0152 grm. of CS_2. The method gives good results. The following numbers were obtained:

	Per cent. CS_2
Fraction boiling between 30° and 80°	57·30
Fraction L 1	19.80
Fraction L 2	19·17

The amount of potassium xanthate may also be estimated by means of a standard iodine solution. The author, however, found that with pure carbon disulphide, the results were about 2·5 per cent. too low. In order to remove the carbon disulphide, the following method was adopted: From 1,000 to 1,200 gms. of first runnings are placed in a flask and treated with from 5 to 6 times the weight of alcohol, the flask and contents being kept in a cooling mixture to prevent loss by evaporation. A constant stream of dry ammonia is then introduced through a wide glass tube, until the separation of solid xanthate is complete, when the mixture is filtered rapidly through a cotton filter, the filtrate being collected in a separating funnel. The lower layer contains the alcohol, some water and a small amount of hydro[redacted] in solution. In order to separate the latter, the mixture is dilute[redacted] water, the product thus obtained is then added to the upper layer and the whole subjected to another treatment with alcohol and ammonia. It is advisable to repeat this operation a third time, in order to ensure the complete removal of all sulphur compounds. The hydrocarbon liquid is then washed thoroughly with water and dehydrated with calcium chloride. The removal of carbon disulphide reduces the specific gravity considerably; thus in the case of fraction L1 it fell from 0·8148 to 0·7401.

2. Nitriles and Isonitriles.—Vincent and Delachanal found acetonitrile in light benzine to the extent of 50 to 70 per cent. Noetling detected the presence of an isonitrile, and showed that in spite of the small proportion of poisonous ingredients found in the first distillate from benzene, the working of light benzenes on a large scale may, under certain conditions, produce poisonous effects. He quoted a fatal case which occurred at a factory in Thann, where a workman, having inhaled the vapour of isonitrile died from its effects. For the quantitative estimation of nitriles the author used the following method: A measured quantity of light benzene was boiled in a flask provided with a reflux condenser for 12 to 15 hours, with half its weight of concentrated hydrochloric acid. The brown mass thus obtained was evaporated to dryness, extracted with hot water, the solution filtered off, again treated with hydrochloric acid, evaporated and extracted with water. The operation was repeated until the residue was coloured only slightly yellow. It was then dissolved, treated with hydrochloric acid, evaporated to dryness in a tared dish, dried at 100° and weighed. The following results were obtained.—

	Per cent. nitrile.
Light benzene boiling between 30° to 80°	7·49
Fraction L 1	11·93
Fraction L 2	10·03

3. Aldehydes and Ketones.—From the circumstance that aqueous solutions extracted from light benzene reduce ammoniacal silver solutions, the author concludes that aldehydes are contained in the first runnings from benzene. He treated a large quantity of fraction L1 with sodium bisulphite, but obtained only about 1 per cent. of extract, and was, therefore, unable to examine the mixture of aldehydes and ketones more closely. He, however, detected the presence of acetone by the characteristic odour, the formation of iodoform and the indigo reaction with orthoditrobenzaldehyde and sodium hydroxide. According to Michael, a bright resinous substance is obtained on boiling aldehyde with an alcoholic solution of resorcinol and a minute quantity of hydrochloric acid (see this Journal, 1884, 253). The author has obtained a similar product by applying the same reaction to light benzene.

4. Ethyl Alcohol.—The author has not been able to isolate this product from any of the fractions obtained by the distillation of light benzene. He, however, obtained a faint reaction for ethyl alcohol from a sample which had been in contact with water for a fortnight, and concludes from this result that light benzene contains an ethyl compound which is gradually decomposed by water with formation of ethyl alcohol.

5. Phenols.—The examination for phenols was conducted in the following manner: After treatment with hydrochloric acid the light benzene was shaken up with dilute soda lye. The alkaline extract was then acidified with sulphuric acid and distilled with steam or extracted with ether. In both cases a product having a tarry odour was obtained, but the quantity was too small to admit of further investigation.

6. Mercaptans.—To detect the presence of these compounds in light benzine the different fractions were heated with mecuric oxide and alcohol, and in a second series of trials they were added to an alcoholic solution of mercuric chloride. The presence of mercaptans could not, however, be established with certainty, as only a slight turbidity was obtained.

7. Detection of bodies belonging to the Pyroll-, Thiophen-, and Furfuran Series, also of hydrocarbons of the Benzine Series.—The vapour from fraction L 1 imparts a greenish colour to pine shavings moistened with hydrochloric acid. The reaction with the phenanthraquinone and with isatin and concentrated sulphuric acid gave no colouration, so that it may be inferred with certainty that no closed chain compounds of the pyrrol, furfaran, or thiophen series are present. It was not possible to separate aromatic hydrocarbons by treatment with a concentrated solution of picric acid, although benzene was found in the residue obtained by fractional distillation.

8. Unsaturated Compounds.—The different fractions from the distillation of light benzene absorb bromine very eagerly, and form additive as well as substitution compounds. The group of unsaturated compounds includes derivatives of acetylene, the author having found that on adding ammoniacal solution of cuprous chloride to light benzene and allowing the mixture to stand, a red-brown precipitate is obtained. *Dingl. Polyt. Jour.*

WORK AND WAGES IN THE UNITED STATES.

ANY investigation that tends to throw light upon the labour question is readily welcomed now that disputes between employed and employers are almost daily occurences; therefore the report of the Labour Bureau of Boston, Massachusitts, on the relation of wages to the total cost of production in that State is doubly welcome, because it enables an exact understanding to be arrived at as to the condition on which manufactures are carried on in the United States. Such evidence is also necessary for the proper adjudication of labour disputes and for the readjustment of a tariff. Although the Bureau has issued many reports, yet it has never investigated this particular question before, the information being, therefore, a novelty in every respect, the value of which is considerably enhanced by the absolute trustworthiness of the statements made, and which is guaranteed by the department.

The *modus operandi* pursued has been to select various articles of manufacture, and give under each head the total cost of producing a specified quantity by percentages showing the proportionate expenses for wages, raw material, and for general expenses such as rent, insurance, taxes, &c. For example, under chemical preparations (compounded) we find that to produce 1,000 gallons 4·76 per cent. is paid as wages, and the remaining 95·24 per cent. for raw materials; showing very clearly the small cost of labour in producing these goods. The materials for a ton of sulphuric acid cost 53·11 per cent., wages 14·67 per cent., and general expenses 32·22 per cent. In the production of twenty-four thousand and ninety-two gross of laundry blue the labour item is 13·09 per cent. raw materials only 15·65 per cent., while the expense of rent, taxes and other incidentals is returned at 71·26 per cent. The labour expense of a barrel of illuminating oil is 6·79 per cent., the materials cost 67·50 per cent., and the general expenditure is returned at 25·71 per cent. Under paints, alum, and crude chemicals we notice that 3,185 tons of copperas costs 22·91 per cent. for labour, 41·66 per cent. for materials, and 35·43 per cent. for unspecified expenses. A pound of black Japan costs 23·53 per cent. for wages, 70·59 per cent for materials, and 5·88 per cent. for rents, taxes, &c. One thousand pounds of green paint cost 10·0 per cent. for labour, and 90·0 per cent. for materials, while the percentages for a gallon of mixed paints are the same. The labour item in the production of a pound of candles is only 4·17 per cent., materials ranging as high as 95·83 per cent. The cost of materials is again the largest amount in 100 lb. of soap, namely, 66·67 per cent., wages being 8·0 per cent., and other expenses 25·33 per cent. A box of mineral soap costs 10·53 per cent. for labour, and 89·47 per cent. for materials; while for 20 barrels of soft soap 12·50 per cent. is allotted to wages, 75·0 per cent. to materials, and remainder to general expenses. Nine hundred and eighty tons of textile soap costs 8·59 per cent for wages, 61·36 per cent. for materials, and 30·05 per cent. for other expenses. Wages are a little lower for a pound of powder soap, namely, 7·14 per cent., materials 57·14 per cent., and general expenses 35·72 per cent.; in 1,400 lbs. of the same article the rate of wages had gone up to 22·22 per cent., and materials 77·78 per cent. 350,000 lb. of tallow costs 4·80 per cent. for wages, 95·51 per cent. for material, and the rest for outside expenses; while a ton of tallow costs 51·67 per cent. for labour and 48·33 per cent for materials. In 100 lb. of tallow oil 6·25 per cent. goes to labour, and the rest to materials. 150 tons of glue has 86·80 per cent. returned for materials, 10·41 per cent. for wages, and 2·79 per cent. for general expenses. A barrel of starch costs 18·55 per cent. for labour, and the rest for materials. Out of a total cost of production returned at 3,259 dols. for compounded chemical productions, 302 dols., or 9·27 per cent., is the wage cost; in a total of 72,505 dols. for dyestuffs, 14,937 dols., or 20·60 per cent. is the wage cost; in 97,351 dols. of oils and illuminating fluid, 5,760 dols., or 5·92 per cent., is the wage percentage; while on a total of 163,741 dols. for paints, colours, and crude chemicals, 16·60 per cent. is the total of wages paid. As regards exports, dyestuffs are reported as under 1 per cent. of the total value of product; paints, colours, and crude chemicals, between 3 and 4 per cent.; oils and illuminating fluids, between 5 and 10 per cent.; and tallow, candles, soap, and grease about 10 per cent. Print-works, dyeworks, and bleacheries report no exports. The sales of oils and illuminating fluids, tallow, candles, soap, and grease in Massachusitts have not decreased in consequence of the importation of foreign goods; but dyestuffs, glue, and crude chemicals have declined from this cause. Dealing with wages, 84 operatives employed in the chemical preparation trade earn about £2. to £2. 8s. per week, while 38 persons earn from £2. 8s. to £3.; the maximum rate is between £3. and £4., earned by 7 persons out of a total of 153. In dyestuffs, the operatives earn from £1. to £5., most of them receiving about £2. to £2. 8s. In the oil trade, the bulk of the workers receive £2. to £2. 8s.; while 69 out of 193 of those employed in the paint and crude chemical trades receive from £2. 8s. to £3., a few obtain between £4. and £5., the remainder earning under £2. In dyeworks and bleacheries wages run at about £1. 8s. to £1. 12s. for 887 workers out of 4,736; 1,127 earn under £1.; 517 receive from £1. to £1. 4s.; 749 obtain £1. 4s. to £1. 8s.; while only 138 reach £3. to £4., and 186 obtain £4. and over.

Legal.

CHEMICAL MERCHANTS' LIABILITY.

BEFORE Mr. Commissioner Kerr, last week, a case of importance to chemical merchants was adjudicated upon in the City of London Court. The litigation was brought by Messrs. Andrew Hunter and Co., chemical merchants, 4, Fenchurch Avenue, E.C. to recover a sum of money back already paid to the defendants, Messrs. Watts, Ward and Co., of Whittington Avenue, Leadenhall Street, E.C.

Mr. GEORGE KEBBELL, who conducted the plaintiffs' case, said the dispute was of considerable moment to the chemical trade because it raised a point which had never yet been decided in any Court of law—at any rate in this country. His clients dealt largely, amongst other things, in Canadian phosphates, and they were the consignees of 90 tons of phosphates by one of the defendants' vessels, the Cressey. In due course, upon her arrival, the plaintiffs as holders of the bill of lading presented it to the defendants accompanied by a cheque for £28. 2s. 6d., the amount of the freight on 90 tons, the quantity stipulated at 6s. 3d. per ton. They demanded delivery of the goods, but then arose a question which led to these proceedings. The defendants said the phosphates would have to be weighed. The plaintiffs agreed, but declined the next request of the defendants, viz, to pay for the weighing. The defendants said they should not allow the phosphates to come out of dock until the money for weighing was deposited. Finding there was no alternative the money was deposited, and this action was now brought to recover it back, less a sum for increased freight. When it was weighed it turned out that there was 91 tons, and that extra freight had been paid for. The question was of the greatest possible importance to chemical merchants, because it would make a considerable difference to their business. The plaintiffs were anxious to do everything that was fair, and expressed their willingness to have the phosphates weighed when it got to its destination at Hamburg. The defendants would not permit of that being done.

HIS HONOUR asked whether the weighing in dock was not rather to the benefit of both the plaintiff and the defendent. Suppose it had turned out there was 87 tons instead of 91 tons, how could the correct weight be found out except by weighing?

Mr. KEBBELL thought the defendants should at least be agreeable to accept the weight on the bill of lading, which was their own making out.

HIS HONOUR said at present he was of opinion that the defendants were right in saying they must have it weighed, and that the plaintiffs must pay for it before they got their goods.

Mr. KEBBELL admitted they were entitled to weigh it, but not at the expense of the plaintiffs who were the consignees.

HIS HONOUR: You declined to pay for the weighing.

MR. KEBBELL: Yes. They counter-claim for the extra weight of the sulphates, which is admitted so far as it refers to an extra ton or so, but the bulk of the counter-claim is based on the charge of 6s. 6d. per ton, whereas the price agreed was 6s. 3d.

Mr. LAING: That is a clerical error.

Mr. KEBBELL asserted that that was an instance of the way the defendants did their work.

HIS HONOUR: The point is, who is to pay for the weighing?

Mr. LAING: We took a preliminary objection, and said we would not part with the phosphates until we got a deposit.

HIS HONOUR said that was making the plaintiffs pay for the weighing. He did not know if there had been any decision on the point.

MR. KEBBELL said the question had never been raised in this country before. He knew of no decision. It was monstrous, he thought, for the defendents to refuse to deliver on their own bill of lading, when the plaintiffs offered to pay what it was. They said they would pay the freight, but not the cost of weighing. The plaintiffs were quite willing to pay on the freight at Hamburg.

HIS HONOUR thought the common sense of the question was that the weighing should be divided. It was for the benefit of both of them.

Mr. F. Sibley, the plaintiff's clerk, said he took the bill of lading to the defendants, but they insisted on the charge for weighing being deposited.

Mr. KEBBELL: I suppose they divide these charges with the Dock Company.

The witness, in cross-examination, said his principals did a large

business in phosphates coming to this country, particularly Canadian. Many of the shipowners accepted payment of the freight on the bill of lading. Phosphates sometimes wasted a little on transhipment, but not much.

His Honour said that was a very good reason for having it weighed when it arrived, because it would be a less weight than when put on board. It was to the interest of the consignee to weigh it.

Mr. Laing; If it was going to Hamburg it would weigh less there than here.

His Honour read the bill of lading. There was nothing about weighing contained in it. Were the defendants entitled to add the condition that the plaintiffs should pay for weighing.

Mr. Laing submitted they were.

The witness said the weight was found to be 91 tons 5 cwt.

His Honour. They are to be guided by the bill of lading. Why are they to be put to the expense of ascertaining the weight?

Mr. Laing: Because it is the custom of the chemical trade for the merchant to pay. It is the universal custom.

His Honour did not agree with that. If the defendants asked for the freight on 90 tons as they did by the bill of lading, the plaintiffs should have tendered it. That they had done, and they were, therefore, entitled to the phosphates. Were the defendants to ask more than was due to keep themselves safe?

Mr. Laing: Yes, if the consignee declines to pay for the weighing. It is the custom for the plaintiffs to pay the weighing. The chemical merchants have been held liable in Scotland.

His Honour knew the law of Scotland was vastly superior to the law of England so far as it was founded on the old Roman law; but it was not binding in any English court.

Mr. Hunter, one of the plaintiffs, said they were one of the largest firms in London dealing in phosphates. It was not the custom of the trade for the merchant to pay for the weighing. He told the defendants he would pay on the Hamburg weights, and that other firms had done the same.

Cross-examined; He did not object to it being weighed, but he did not want to have to pay for it. He had been in the trade for 11 years, and had a great many cargoes a year. A great portion of the phosphates he sold went to Hamburg.

His Honour: If the defendants will make a contract in such terms as these, they must put up with the consequences. That is what it comes to.

In support of the defendants' case, Mr. Beerman was called. He was in the employ of the Surrey Commercial Docks, he said, and had to do with a great many shipments of phosphates which came into this country. When a weighing order was given it had to be paid for by the merchant. That was the general custom.

Mr. Anderson, in the office of the Millwall Dock Company, said a part of his duty was to superintend the delivery of phosphates which came to this country. Merchants always paid for the weighing, where they ordered it to be done,

His Honour: The phosphate trade has only begun in the last year or two, has it not.

The witness: No; phosphate has come to this country for the past 20 years.

Mr. Ward said one firm he knew had a standing order with the Dock Company for their phosphate to be weighed.

His Honour said, giving an order was not consistent with there being a custom. The moment the giving of the order was necessary, it showed that the custom did not operate. A custom must be universal. He must find for the plaintiffs for the sum sued for, with costs, as well as for the plaintiffs on the counter-claim. Judgment accordingly.

Treating Fibrous Plants for Bleaching Etc.--For treating fibrous plants such as China grass, flax, hemp, and the like, Sutherland and Esdaile direct in their patent that the material is to be first worked in an alkaline solution, such as carbonate of soda at 2° to 4° Tw., containing mineral oil or wax; about one pint of oil or ½ lb. of wax to eight gallons of solution, boiling from thirty minutes to three hours, then washing and drying. After drying, the material is steeped in paraffin oil until it is saturated, wrung out, and passed again in the alkaline solution. It is claimed for the treatment that it enables the bleaching to be more easily performed, facilitates spinning, that the fibre will "flock," and will not "cut." In another patent to the same persons it is proposed to heat ordinary cotton, previous to manufacture, with an alkaline solution—carbonate of soda, for example—for some hours, then wash and dry. Some advantages are said to follow their treatment. The fibre will "flock," spin more easily, "and make stronger yarn, thread, or strand." Other fibres than cotton, if treated in this way, are said to be capable of being spun by cotton machinery, if cut down by proper apparatus to the length of cotton fibre.

Correspondence.

***We do not hold ourselves responsible for the opinions expressed by our correspondents.*

ANSWERS TO CORRESPONDENTS.

A.W.P.—Picrate of potash, about 10 grammes per litre.

H.S.C.—Declined with thanks.

Victim.—You are confusing free with albuminoid ammonia.

P.T.—The process is at least one hundred and fifty years old; it has been practised in Spain probably much longer.

Salt.—We believe the company is in liquidation, and the works are standing.

Rio.—Your best plan would be to send samples to England, when their value could be determined. Certainly the manufacture could be carried on at Rio de Janeiro, or at several other places on the coast, and you say there is a demand.

M.M.I.Sc.S.—Surely you mean an electro-magnet. Your idea about the secondary cell is a good one.

B.H.B.—Next week.

J. P. and Co.—Try Brannt's "Practical Treatise on Animal and Vegetable Fats and Oils," Philadelphia, H. Carey, Baird and Co.; or "Soap, Candles, Lubricants, and Glycerine," by Carpenter, E. and F. N. Spon, London. Professor Thurston has, we believe, published valuable contributions on the subject.

NOTICE.

WE have decided to commence a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

October 7th.—"Manufacturing Smoke."
November 4th.—"Domestic Smoke."
December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the first lecture—"Manufacturing Smoke"—the chair will be taken by Alfred E. Fletcher, Esq., Her Majesty's Chief Inspector of Alkali, &c., Works; and models of various appliances will be exhibited.

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

Trade Notes.

A Process for Recovering Tin.—The French Society for the Encouragement of National Industry have given the prize alloted for the utilisation of works' residues to M. Martinon, for his process of recovering the tin contained in the wash waters from silks which have been treated with bichloride of tin, for the purpose of giving weight. By adding milk of lime to the water, and by properly agitating, the tin settles down in a few hours in the state of oxide, which can be readily collected and disposed of. This economy is said, for Lyons alone, to effect an annual saving of £12,000.

Covering Steam Pipes and Distilling Wood.—A correspondent sends the following:—"We shall be glad if you could inform us the best composition for covering steam pipes that are exposed to all weathers; and could you in your valuable paper give some information of the different works in America and on the Continent that distil wood, if their process is different to that which is used in this country, and if they have natural advantages which the works in this country do not possess. We confess we cannot understand how they can keep on sending such large quantities of their products now the price is so remarkably low." (Perhaps some of our readers can give the required information.—Ed. *C. T. J.*)

ELECTRICITY AND MINING.—An important section in next year's International Mining Exhibition at Frankfort will be a section devoted entirely to mining operations. The different applications of electricity to mining purposes will be demonstrated in such a manner as would obtain in practical work, and this will be the case in all the sections. Messrs. Siemens and Halske, of Berlin, will have, in addition to three other systems of electric traction, an electric railway for mining purposes in operation.

FAILURE IN THE CHEMICAL TRADE.—A meeting of the creditors of John Nicol, trading as "Nicol and Co.," chemical, metal, and mineral merchant, at 50, Fountain-street, Manchester, was held yesterday at the offices of the Official Receiver, Bridge-street, in this city, the Assistant Official Receiver (Mr. A. B. Potter) presiding. The net liabilities of the debtor are £2,341. 6s. 11d., and the net assets amount to only £28., leaving a deficiency of £2,313. 6s. 11d. The debtor alleges the causes of his failure to be insufficient capital and consequent inability to buy in the best markets and on the best terms. According to statements which have been made by the debtor, it appears that he formerly traded in partnership as a chemical merchant, and since June, 1888, he traded alone under the style of "Nicol and Co." The Assistant Official Receiver remarked yesterday that the debtor appeared for some time to have been systematically selling goods under cost price. The estate remains in the hands of the Official Receiver as trustee.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

Makers continue to be well engaged with orders for all products of the alkali trade—prices remain firm. In caustic soda, the output has scarcely yet overtaken the demand, and quotations for early deliveries remain in about the same position. Forward delivery can, however, be obtained at lower prices. Spot quotations are for 74%, £12. 15s.; 70%, £11. 15s.; 60%, £10. 15s.; cream, 60%, £9. 17s. 6d. per ton—all f.o.b. Liverpool. In soda ash prices are rather higher, there being little now obtainable below 1⅜. per deg., and for certain brands even higher figures are named. Makers are well sold forward over 1891, the average prices realised being 1⅝ to 1⅜ f.o.b. Bleaching powder has been moving off steadily at the lower prices, but the output being ample for all requirements, prices show no improvement, and orders can be filled at £5. 2s. 6d. to £5. 5s. per ton at works for early deliveries. Business for 1891 has received a slight check, owing to the low price now ruling. The Union price of £6. is still maintained for next year's deliveries. Soda crystals steady, £3. to £3. 5s. at makers' works. Sulphur well sold for early and forward delivery, price firm £4. 2s. 6d. at makers' works in bulk. Chlorate of potash in better demand, and makers now quote 5½. Some re-sales still to be had at 5¼. Sulphate of copper steady for prompt, and firm for future deliveries—present value £19. 10s. to £20., and for 1891 £21. 5s. to £21. 10s. Acetate of lime without change, either for prompt or forward. Acetate of soda more scarce, and price much firmer. Acetates of lead dearer. Potash caustic carbonate still scarce, and difficult to obtain for early deliveries. Permanganates of potash lower, and the various makers are competing keenly for business. Carbolic crystals without change. Vitriol dearer in all districts.

THE LIVERPOOL COLOUR MARKET.

The steadiness reported in our market last week has been continued. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire, common, 40s., medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc remain firm. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron, more doing, common, £6.; medium, £10.; finest, £20.

REPORT ON MANURE MATERIAL.

There has been more disposition on the part of buyers of phosphatic material to do business, induced by a somewhat easier attitude on the part of sellers. Nitrogenous material, too, is a shade easier, and a fair business has been done both on spot and forward.

Prices for mineral phosphates remain without important alteration, and the position remains very much the same as we reported a week ago.

We do not hear of any transactions in River Plate cargoes of bones, and in the absence of business we cannot quote value at over £5. 10s. delivered U.K. ports. Considerable business has been done in East Indian bone meal, for shipment, at £5. 16s. 3d. per ton, delivered ex-quay Liverpool, and this price would be accepted for further quantity, £5. 10s. would probably be accepted for crushed Kurrachee bones, but buyers do not seem inclined now to buy at that price, anticipating some further decline. Common grinding bones are more freely offered, and would hardly fetch more than £5. to £5. 2s. 6d. ex-quay Liverpool. River Plate bone ash is firm at £5. 7s. 6d. on 70%, nett, delivered U. K. or Continent.

The nitrate of soda market has been quiet for the last fortnight, and sellers would probably have to make some concession on current quotations to induce any large business. Spot is worth 8s. 4½d. for ordinary quality, and 8s. 6d. per cwt. for refined. Due cargoes are nominally worth 8s. 7½d. to 8s. 8¼d., according to size, but sellers would have to take less to effect sales. October-November guaranteed shipments are not to be bought at under 8s. 10½d. to 8s. 11¼d. per cwt., according to size, but December could be had at about 8s. 9d. per cwt.

Dried blood is still very quiet at 10s. 3d. to 10s. 6d. per unit of ammonia, delivered f.o.r., according to the position of the works. There is more enquiry for ground hoof, and about 9s per unit, f.o.r. at works, would now probably have to be paid for any quantity.

The market price for supers is still 50s. per ton, in bulk, f.o.r. at works, but home buyers do not seem to be in any hurry to cover their spring requirements at the price, though there does not appear to be in the market for the raw material any warrant for lower prices for superphosphates later on.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron was depressed on rumours of a probable end of the Scotch strike. Scotch warrants closed at 51s. 2½d. cash, and 51s. 6d. one month. Middlesbrough, 48s. cash; hematite, 57s. 10d., cash. Copper a shade harder. Chili bars, G.O.B.'s and G.M.B.'s closed at £59. 7s. 6d. to £59. 15s. cash, and £59. 17s. 6d. to £60. 5s. three months. Tin very flat: Straits closed at £100. 15s. to £101. 5s. Lead: Spanish, £14. 12s. 6d. to £14. 15s.; English, £14. 15s. to £14. 17s. 6d. Spelter: Silesian, ordinary, £25. to £25. 5s. Quicksilver, £10. 10s. first hand; £10s. 3s. 6d. second hand. Copper shares: Rio Tinto, 25 5/16 to 25 7/16; Mason and Barry, 7⅞ to 8⅛; Tharsis, 5¾ to 6; Cape, 5 1/16 to 5 3/16; Namaqua, 3 to 3⅛; Copiapo, 3 to 3⅛; Libiola, 2 13/16 to 2 15/16; Panulcillo, 1⅛ to 1¼.

GLASGOW, WEDNESDAY.—Market irregular, with a fair business. Scotch done at 51s. 6d., 51s. 4½d., and 51s. 2d., cash, also at 51s. 8d. 51s. 9d., and 51s. 5½d., one month; closing buyers at 51s. 2½d., cash, sellers ask ½d. more. Middlesbrough done at 48s. 3d., nine days, also at 48s. 7d., to 48s. 4½d., one month; closing buyers at 48s. cash, and 48s. 3d. one month, sellers ask 3d. more. Hematite closes with buyers at 57s. 10½d. cash, sellers ask 58s. 2d. one month, and 58s. cash.

WOLVERHAMPTON, WEDNESDAY.—The quarterly meeting was held here this afternoon. There was a quiet but confident tone. The Scotch blast furnace strike caused pig iron to be very firm. Cinder sorts were 45s. and part mines 50s. Tredegar, South Wales, No. 4 hematites were quoted 70s., delivered; Staffordshire and second qualities, 60s.; Northamptons and Derbyshires were 51s. to 52s. 6d.

TAR AND AMMONIA PRODUCTS.

Benzol is higher. From London business in 90's, for delivery to March, 91' is reported at 4s. 6d. This, however, seems to have been an exceptional transaction, and the regular market price for 90's, f.o.b. eastern ports, cannot fairly be called more than 4s. 4½d., and 50/90's is worth about 3s. 3d. to 3s. 4d. The solvent naphtha market continues firm, and good qualities are in great demand. Creosote is also firm, especially good qualities, which are used for lighting. Anthracene keeps very steady at 1s. 6d. for 30% A and about 1s. 2½d. for 30% B. There is nothing fresh to report in the pitch market.

The sulphate of ammonia market remains very steady, although dealers who want to buy are doing their very utmost to reduce prices. £11. 10s. remains the current quotation at Hull and Leith, and at Liverpool ordinary makes can be bought at the same price. Sulphate has been offering a little more freely lately, but while the demand is equal to the production there is no doubt that prices will be well maintained. Beckton price is £11. 12s. 6d., and the same value may be quoted for outside London makes. It is pleasing to note that there is rather more enquiry from the Continent, and that makers are confident of seeing the present prices at least maintained.

THE LIVERPOOL MINERAL MARKET.

There has been a good amount of business done this week, and prices have continued firm. Manganese: Arrivals this week have been small. All, however, have gone direct into consumption, and prices still rule steady. Magnesite: Stocks still large, and prices practically in buyers' hands. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £11. Bauxite (Irish Hill brand): The strong demand last reported continues at the advanced prices; lump, 22s.; seconds, 18s.; thirds, 14s.; ground, 35s. French chalk: Arrivals are under the average, and prices remain strong, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate is easier, without alteration in prices. Sulphate in demand, especially for finest "Angel White." Pumicestone unaltered: ground at £10., and specially selected lump, finest quality £13. Iron ore easier, and more inquiry for Spanish manganiferous; Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore quiet. Emerystone: There is little alteration to report in prices No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal in demand, at somewhat better prices. Chrome ore quieter. Antimony ore and metal in demand at full figures. Asbestos in strong demand, especially Canadian rock, which commands full figures. Potter's lead ore of best and "standard" brands in request; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Good qualities in demand at top prices. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, steadier. Plumbago: Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay, more doing—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), firm, finest quality, 22s.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Chlorate of potash has advanced from 5¼d. to 5½d., the highest attained since December, 1888, when it began to fall, and, therefore, a shade higher than the summit price of the recovery of October—November of last year. Soda crystals are firmer, advancing a 6d.; and bicarbonate of soda, alum, and sulphate of copper are also higher. The blast furnacemen sticking to their guns on Saturday, the last day of notice, masters damped down the rest of the furnaces, and it is now war to the bitter end. Out of over 80, there are now only six in blast in Scotland, three of these on ordinary make at the Carron Works, and three upon basic at Wishaw, the men at these not being subject to the Union. This affects the supply of sulphate of ammonia, considerable quantities having been saved by the ironmasters from the coal consumed in the furnaces, and holders are now looking for some little advantage from the circumstance. The latter are asking £11. 10s. to-day, but buyers' views do not exceed £11. 7s. 6d., and consequently the sulphate market is for a time quite an idle one. There is no change in the paraffin section, except, perhaps, in the department of lubricating oils, which are a shade firmer. Bichromates have been asked after moderately, only; bleaching powder is stationary, and caustic soda, although still high, shows signs of, at least, a partial giving way. Chief prices current are:—Soda crystals, 56s. 6d. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 7½%, Tyne; caustic soda, white, 76°, £13. 5s., 70/72°, £11. 10s., 60/62°, £10. 10s., and cream, 60/62°, £9. 10s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £6. 5s., and 1 cwt. casks, £6. 15s., net Tyne; refined alkali, 48/52°, 1⅜d., less 1½% Tyne; saltcake, 40s.; borax, English refined, £30., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 7s. 6d. to £5. 12s. 6d., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., less 5% f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. less 5% f.o.b. Glasgow; chlorate of potash, 5⅜d., less 5% any port; nitrate of soda 8s. 6d. to 8s. 7½d.; sulphate of ammonia, £11. 7s. 6d. to £11. 10s., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £19. 10s., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb.; paraffin wax, 120°, semi-refined, 3⅜d.; paraffin spirit (naphtha), 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 86° £5. 10s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. W[illegible]'s imports of sugar at Greenock were again *nil*.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There is little change to report in chemicals this week. The market continues steady, but there is not much doing. Caustic soda continues in strong demand, and price is fully maintained.

Recovered sulphur has been advanced 5s. per ton for next month's delivery, makers being fully sold for this month. Bleaching powder and soda crystals are both slightly easier at the moment. Soda ash and sulphate of soda continues steady at last week's quotations.

For prompt delivery, to-day's prices are as follows:—Bleaching powder in softwood casks, £5. 5s. per ton; hardwood casks £5. 10s. per ton. Caustic soda, 77%, £12. per ton; for solid in drums, £15. per ton, ground and packed in 3-4 cwt. barrels; soda ash, 48/52%, 1⅜d. per degree less 7½%; soda crystals, 55s. per ton; sulphate of soda, in bulk 35s. per ton; ground, in casks, 45s. per ton; recovered sulphur, November delivery, £4. 10s. per ton; chlorate of potash, 5¼d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton.

For delivery November and December, makers quote bleaching powder, £6. per ton; 77% caustic, £12. per ton; soda ash, 1⅜d. per degree. Soda crystals, 56/6 per ton; Sulphate of soda, in bulk, 40s. per ton; ground, in casks, 50s. per ton; chlorate of potash 5½d. per lb., all less 3½% discount, f.o.b. Tyne, or f.o.r. makers' works.

Small coals for manufacturing purposes are being offered more freely, and, prices are again easier. Northumberland steam small, good qualities are offering at 6s. 6d. per ton, and Durham small ranges from 6s. 6d. to 7s. 6d. per ton, according to quality.

The exports of chemicals from the Tyne for the first nine months of this year and corresponding period of 1889 are as follows:—

	1890.	1889.
Alkali and soda ash	11,857 tons.	10,601 tons.
Bicarbonate of soda.....	53	84
Bleaching powder	21,496	15,282
Manure.....	16,667	12,274
Soda Crystals	11,172	12,194
Sulphate of soda	1,521	363
Caustic Soda.....	3,958	19,353
Other Chemicals.....	12,189	
	78,913	70,151

Gazette Notices.

PARTNERSHIPS DISSOLVED.

GRIME and RUSSELL, Ashton-under Lyne, oil and tallow merchants.
W. CORRIE and T. A. COOK, under the stlye of Corrie, Cook and Co., Liverpool, manufacturing perfumers.
COCKROFT and TAYLOR, Birstall, mineral water manufacturers.
SALING and SMITH, Bermondsey-street, Bermondsey, leather dressers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

BENNETT, SAMUEL, Tunstall, drysalter.

Adjudications.

BENNETT, SAMUEL, Tunstall, drysalter.

New Companies.

BONARO ITALIAN STEEL AND TIN-PLATE MANUFACTURING COMPANY, LIMITED.—This company was registered on the 1st inst., with a capital of £160,000., in £1. shares, 1,000 being founders' shares, to acquire the benefit of a concession or *privativa industriale*, granted by the Italian Government to Signor Agostino Bonaro, of Genoa, for the establishment of tin-plate works in Italy for a term of 15 years from 31st March, 1890. The subscribers are:—

	Shares.
T. Bradfield, 12, Dovecote-avenue, Woodgreen, cashier	1
C. Fox, 46, Park-road, Finsbury-park, law stationer	1
P. H. Dabise, 139, Cannon-street, merchant	1
A. S. Russell, 21, Evering-road, Stoke Newington, cashier	1
A. F. M. Herold, 9, Leamington-road-villas, Bayswater, traveller	1
A. W. Beattie, 5, Sutherland-road, Tottenham, clerk	1
M. Rathgen, 18, Mount-view-road, Stroudgreen, correspondent	1

CHEMICAL PATENTS COMPANY, LIMITED.—This company was registered on the 1st inst., with a capital of £2,750., in £1. shares, to carry on business as patentees and proprietors of patents for inventions. The subscribers are:—

	Shares.
J. Prichard, 32, Oval-road, Clapham-road, clerk	1
Wm. King, St. Alban's, clerk	1
H. E. Harman, 10, Fitzroy-square, clerk	1
W. G. H. Monypenny, Hadlow, Kent	1
H. E. Monypenny, Hadlow, Kent	1
W. E. Geach, 13, Lovell's-court, E.C., printer	1
A. A. Vicary, 109, Gray's-inn-road, compositor	1

ELMORE'S AUSTRO-HUNGARIAN PATENT COPPER DEPOSITING COMPANY, LIMITED.—This company was registered on the 26th ult., with a capital of £200,000., in £2. shares, to carry into effect an agreement made between Elmore's Foreign and Colonial Patent Copper Depositing Company, Limited, of the first part; Woodhouse and Rawson United, Limited, of the second part; and the company of the third part. To carry on in Austria, Hungary, and elsewhere, at such places as the directors of the company shall think fit, and whether as principals or agents, the business of manufacturers of and dealers in copper and other metals, and all metallic alloys or compounds of the same, and all goods and articles made of copper or other metals and alloys. The first subscribers are:—

	Shares.
G. Worrall, 29, Percy-road, Forest-gate, secretary	1
J. Mumford, 50, Trinity-square, Borough, accountant	1
A. M. G. Carter, 40, Denning-road, Hampstead	1
B. F. Howard, St. James's-lodge, Beckenham	1
H. Villars, 6, Penshurst-road, N.E., shipping clerk	1
A. W. Taylor, 53, Bloemfontein-avenue, Shepherd's-bush	1
E. W. Clayton, 9, Hollywood-villas, Southfields	1

HORLEY BRICK AND TILE MANUFACTURING COMPANY, LIMITED.—This company was registered on the 26th ult., with a capital of £5,000, in £1. shares, to take over the brick and tile manufacturing business of Mr. Richard Jennings, at Horley, Surrey. The subscribers are:—

	Shares.
W. R. Larminie, junr., Athenæum Club	1
Capt. E. B. Grant, 145, Warwick-street, Eccleston-square	1
R. Waugh MacArthur, 21, Westmorland-road, W.	1
R. Jennings, Horley, contractor	1
H. S. Head, Horley, architect	1
H. Jennings, Horley, builder	1
A. Walker, 7, Victoria-street, Westminster	1

PERUVIAN PETROLEUM SYNDICATE, LIMITED.—This syndicate was registered on the 29th ult., with a capital of £10,000., in £50. shares, to acquire lands, mines, mining rights, concessions, and other property, and to carry on business as miners, quarrymen, manufacturers and refiners of mineral oil or chemical products. The subscribers are:—

	Shares.
J. Harris, M.E., Longton-avenue, Upper Sydenham	1
G. G. Sedgwick, 45, Rutland-gate	1
E. A. White, 34, Jerningham-road, Hatcham	1
G. P. Causton, Chigwell, clerk	1
A. G. Parker, Loughton, Essex, clerk	1
H. W. Lowick, 258, St. Paul's-road, Highbury	1
A. Suart, 32, Great St. Helen's, shipowner	1

PHOSPHATE MINES OF SPAIN, LIMITED.—This company was registered on the 26th ult., with a capital of £46,000., in £1. shares, 6,000 of which are founders' shares, to carry into effect an unregistered agreement made September 22, between John Horwell Stone of the first part, the Commercial Contract Corporation, Limited, of the second part, and Thomas Lund, on behalf of the company, of the other part, for the sale to the company of certain mining rights over land containing phosphate deposits, situate in the province of Caceres, Spain. The first subscribers are:—

	Shares.
G. F. Griffin, C.E., 7, Mandeville-place, Portman-square, W., secretary to companies	1
A. T. S. Jones, 54, Gloucester-street, Warwick-square, S.W.	1
W. J. Robson, C.E., 18, Cadogan-gardens, S.W.	1
G. F. Daniell, 21, Wheathill-road, Anerley	1
F. A. Rawlings, 15, Coleman-street, E.C.	1
W. R. Dalzell, 2, Reading-villas, Leytonstone, secretary to a company	1
H. Lafone, 50, Gracechurch-street, solicitor	1

WALKDEN AND DIXON, LIMITED.—This company was registered on the 26th ult., with a capital of £20,000., divided into 1,500 cumulative 7 per cent. preference, and 500 ordinary shares of £10. each, to acquire the business of James Dixon, of Randal-street, Blackburn, paper stainer. The subscribers are:—

	Shares.
James Dixon, Blackburn, paper stainer	1
C. Dixon, Blackburn, paper stainer	1
E. Appleby, Blackburn, corn merchant	1
B. Ormerod, Blackburn, mill manager	1
James Dixon, Blackburn, paper stainer's foreman	1
J. Birtwell, Blackburn, wholesale grocer	1
R. Parkinson, Blackburn, plate worker	1

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Separation of Oxygen and Nitrogen. J. H. Parkinson. 14,925. Sept. 22.
Producing Porous Permanganate of Potash. J. H. Parkinson. 14,931. September 22.
Manufacture of Glass Ware. H. R. Lumley. 14,935. September 22.
Preparation of Leather. 14,943. September 22.
Explosives. E. Davies. 14,947. September 22.
Treatment of Spent Tan. A. G. Hughes. 14,962. September 22.
Extraction of Precious Metals. J. B. Hannay. 14,966. September 22.
Withdrawing Coke from Ovens.—(Complete Specification). W. R. Lake. 14,968. September 22.
Electric Meters. W. T. Goolden and S. Evershed. 14,974. September 22.
Manufacture of Glass Ware.—(Complete Specification). J. T. King. 14,983. September 23.
Boiler Stoking Apparatus. T. Wrigley. 14,985. September 23.
Chemical Fire Extinguishers. C. M. Martin. 14,987. September 23.
Artificial Fuel. W. Smith. 14,988. September 23.
Apparatus for Filling Blast Furnaces.—(Complete Specification). A. E. Brown. 15,004. September 23.
Treatment of Smoke and Fumes. H. H. Hazard. 15,508. September 23.
Artificial Fuel.—(Complete Specification). W. B. McClure, E. Corning, T. Hodgson, J. E. McWilliams, and J. W. White. 15,012. September 23.
Ore Concentrators.—(Complete Specification). W. P. Thompson. 15,021. September 23.
Electro-Deposition of Alloys S. O. C. Coles. 15,054. September 23.
Electrical Prevention of Boiler Scale. J. Tellefsen. 15,061. September 23.
Photographic Chemicals. A. McDonald. 15,091. September 24.
Improved Photometer. F. C. Suggate. 15,092. September 24.
Secondary Batteries. G. C. Fricker and J. R. Bainton. 15,114. September 24.
Manufacture of Black Colouring Matters. O. Imray. 15,120. September 24.
Brick Kilns. W. Rennie. 15,139. September 24.
Paper as Substitute for Glass. M. J. Norwood. 15,142. September 24.
Separation of Oxygen and Nitrogen. J. H. Parkinson. 15,158. Sept. 25.
Producing Porous Permanganate of Soda. J. H. Parkinson. 15,159. Sept. 25.
Recovery of Tin and Iron from Tin Sheet Clippings. C. L. C. Berton. 15,174. Sept. 25.
Silicates for Glass Making. H. C. Bull and P. Hargan. 15,197. Sept. 25.
Moistening Air and Veintilating. W. Matthews, J. Yates and W. Yates. 15,240. Sept. 26.
Black Dyeing Materials. J. Wright. 15,246. Sept. 26.
Dynamos. W. B. Sisling, W. H. Scott and Lawrence Scott & Co. 15,248. Sept. 26.
Coating Iron with other Metals. F. Braby. 15,260. Sept. 26.
" " F. Braby. 15,261. Sept. 26.
New Process for Desiccation or Evaporation. F. M. Robertson. 15,277. Sept 26.
Manufacture of Hollow Glass Ware. D. Rylands. 15,301. Sept. 27.
Glass Tubes or Pipes. J. Armstrong. 15,304. Sept. 27.
Treatment of Slag.—(Complete Specification). O. B. Peck. 15,341. Sept. 27.
Treatment of Slag.—(Complete Specification). O. B. Peck. 15,343. Sept. 27.
Centrifugal Apparatus for Treating Molten Metal.—(Complete Specification). O. B. Peck. 15,343. September 27.
Blue Colouring Matters. B. Willcox. 15,345. September 27.
Azo Dyestuffs. S. Pitt. 15,346. September 27.
Production of Azo Colours in Substance or on the Fibre. S. Pitt. 15,347. September 27.
Centrifugal Apparatus for Treating Molten Material.—(Complete Specification). O. B. Peck. 15,348. September 27.
Centrifugal Apparatus for Treating Molten Material.—(Complete Specification). O. B. Peck. 15,349. September 27.
Manufacture of Yeast. H. H. Lake. 15,352. September 27.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Sept. 27th.

Antimony Ore—

France, 10 t.	Holmes & Co.
" 14	"
Portugal, 9	H. Emanuel
France, 59	Smith, Sundius, & Co.
" 25	H. Emanuel

Acetate of Lime—

U. States, 610 pks.	Johnson & Hooper

Acids *(otherwise undescribed)*

Holland, £38.	J. Parleoliet

Bones—

Germany, 17 t.	A. & W. Nesbitt
N. Russia, 20	Flack, Chandler, & Co.
Sydney, 6¼	Coml. Bank of Sydney
" 8¾	Goad, Rigg, & Co.

Bones—*continued.*

Rockhampton, 4 t.	Goldsborough, Mort. & Co.

Brimstone—

France, 16 t.	Thames S. T. Co., Ltd.

Barytes—

Germany, 23 cks.	W. Harrison & Co.
Holland, 22	"
Belgium, 141	A. Zumbeck & Co.
" 91	W. A. Rose & Co.

Barytes—*continued.*

" 41 cks.	W. Harrison & Co.
Germany, 21	C. Turner & Son
Holland, 22	O'Hara & Hoar
Belgium, 24	A. Zumbeck & Co.
Germany, 16	H. J. Perlbach & Co.
Belgium, 21	E. & J. Hirch

Borax—

Germany, £56.	F. Stahlschmidt & Co.
" 56	J. Elinguis

Barium Chloride—
Germany, £40. Petri Bros.

Cobalt Ore—
N. S. W., 36 t. Watt, Gilchrist, & Co.

Copperas—
Germany, £50. B & N. Wvs. Co., Ltd.

Copper Sulphate—
Germany, £150. Charles & Fox

Caoutchouc—
Germany, 1 cs. Hoare, Wilson & Co.
E. Indies, 30 L. & I. D. Jt. Co.
Zanzibar, 41 ,,
,, 34 c. ,,
,, 41 Anderson, Weber, & Smith
,, 38 Hale & Son
,, 38 Clarke & Smith
,, 21 Lewis & Peat
Tamatave, 79 Beresford & Co.
Nossi Be., etc., 164 c. A. Frey & Co., Limited
Zanzibar, 237 L. & I. D. Jt. Co.
,, 89 Forbes, Forbes, & Co.
,, 33 L. & I. D. Jt. Co.
Ecuador, 28 Prop. Bull's Wf.
Germany, 9 ,,
Singapore, 93 Kaltenbach & Schmitz
Tamatave, 12 Brookes & Green

Cream of Tartar—
France, 10 pks. W. C. Bacon & Co.
,, 2 E. W. Carling & Co.
,, 5 M. Ashby, Ltd.
Holland, 46 Middleton & Co.
France, 10 W. C. Bacon & Co.
,, 10 B. & F. Wf. Co., Ltd.

Chemicals *(otherwise undescribed)*
Germany, £9. Craven & Co.
,, 430 A. & M. Zimmermann
,, 120 T. H. Lee
,, 45 Phillipps & Graves
,, 48 W. Burton & Sons
,, 7 T. H. Lee
France, 13 C. Brumlen
,, 10 C. F. Gerhardt
Germany, 220 A. & M. Zimmermann
Holland, 278 ,,
Germany, 7 T. H. Lee
,, 6 ,,
,, 440 A. & M. Zimmermann
,, 57 Phillipps & Graves

Dyestuffs—
Cochineal
Canaries, 6 pks. Kuhner, Henderson, & Co.
,, 30 W. M. Smith & Sons
Las Palmas, 14 Hammond & Co.
Myrabolams
E. Indies, 803 pks. Hoare, Wilson, & Co.
,, 1,234 W. Shelcott
,, 1,810 Marshall & French
Argols
France, 50 N. S. S. Co., Ltd.
Logwood
Jamaica, 14 t. Park, Macfadyen, & Co.
Fustic
Jamaica, 59 ,,
Sumac
France, 250 Beresford & Co.
,, 282 ,,
Safflower
E. Indies, 24 pks. Vanden, Kerchove, & Co.
Valonia
Smyrna, 45 t. A. J. Humphrey
Gambier
Singapore, 316 pks. Beresford & Co.
E. Indies, 251 Elkan & Co.
,, 505 Brinkmann & Co.
,, 261 Beresford & Co.
,, 644 L. & I. D. Jt. Co
,, 276 J. H. & G. Scovell
Singapore, 350 W. H. Cole & Co.
,, 287 R. & J. Henderson
E. Indies, 251 L & I. D. jt. Co.
Gambier, 1,556 ,,
,, 210 W. H. Cole & Co.
Singapore, 210 Cox, Paterson, & Co
E. Indies, 90 L. & I. D. Jt. Co.
Indigo
Germany, 2 chts. Schenker & Co.
E. Indies, 60 L. & I. D. Jt. Co.
,, 57 ,,
,, 8 J. Palpe & Co.
,, 10 L. & I. D. Jt. Co.
Extracts
U. States, 25 pks. L. J. Levinstein & Sons
,, 335 T. Ronaldson & Co.
France, 300 L. J. Levinstein & Sons
Halifax, 1,120 A. J. Humphrey

Extracts—*Continued.*
Belgium, 25 pks. A. Hagan
,, 146 L. J. Levinstein & Sons
France, 2 J. Burnett & Sons
,, 62 Prop. Chmbln's Wf.
Tanners' Bark
Belgium, 13 t. G. S. N. Co.
Melbourne, 33 Baxter & Hoare
Belgium, 100 Fardell & Co.
N. Zealand, 3 L. & I. D. Jt. Co
Saffron
Spain, 1 pkg. B. & N. Wvs. Co. Ltd.
,, 1 ,,
Alizarine
Holland, 47 pks. J. Forsey

Glycerine—
Germany, £30 Beresford & Co.
,, 65 ,,
,, 50 H. Lambert
Holland, 460 Spies Bros. & Co.
,, 65 G. Rahn & Co.
,, 70 T. H. Lee
Germany, 127 A. & M. Zimmermann

Gutta Percha—
E. Indies, 180 c L. & I. D. Jt. Co.
Singapore, 407 Huttenbach & Co.
,, 85 Horsley, Kibble & Co.
,, 286 Soundy & Son
,, 522 Kaltenbach & Schmitz

Glucose—
Germany, 100 pks. 100 cwts. Proprs. Sun Wf.
,, 10 68 J. Knill & Co.
,, 50 489 Props. Chmbln.'s Wf.
,, 200 200 J. F. Ohlmann
Holland, 209 200 T. H. Lee
France, 30 100 Carey & Sons
,, 200 200 De Paiva, Norman & Co.
,, 100 100 H. A. Litchfield & Co.
Germany, 50 390 L. Sutro & Co.
U.S., 50 381 ,,
,, 400 400 Barrett, Tagant & Co.
,, 80 440 Howell & Co.
,, 50 300 Pillow, Jones & Co.
Germany, 26 215 Props. Chmbln.'s Wf.

Guano—
W. Africa, 489 t. D. de Pass & Co.

Isinglass—
Penang, 20 pks. L. & I. D. Jt. Co.
U.S., 7 W. M. Smith & Sons
Singapore, 6 Prprs. Bull Wf.
E. Indies, 3 L. & I. D. Jt. Co.
,, 12 Clarke & Smith
,, 12 cs. ,,

Manure—
Belgium, 347 t. Lawes Manure Co. Ld.
France, 201 ,,
,, 135 Ang. Cntntl. G. Wks.
Germany, 50 Perkins & Homer
Belgium, 500 Lawes Manure Co. Ld.

Naphtha—
Belgium, 26 drs. Stein Bros.

Nitre—
Bolivia, 8,127 bgs. W. Montgomery & Co.

Plumbago—
E. Indies, 390 cks. Prop. Chmbln.'s Wf.
,, 88 brls. L. & I. D. Jt. Co.
,, 96 G. S. N. Co.
,, 323 T. Jordan & Co.
,, 100 E. Barber & Co.
,, 54 Prop. Chmbln.'s Wf.
,, 36 Hoare, Wilson & Co.
,, 115 J. Thredder, Son & Co.
,, 180 cks. Prop. Sun Wf.
,, 200 R. G. Hall & Co.
Germany, 330 E. Pink & Sons
E. Indies, 161 Thredder, Son & Co.
Germany, 71 cs. Brown & Elmslie

Paraffin Wax—
U.S., 60 cs. H. Hill & Sons
,, 100 brls. J. Lucey & Sons

Potassium Muriate—
Germany, 1,224 pks. Anglo Cntntl. G. Wks.

Potassium Sulphate—
Germany, 42 pks. H. Lambert
,, 62 Petri Bros.

Pitch—
France, 6 brls. Poth, Hille & Co.

Potassium Carbonate—
Holland, 25 pks. Spies Bros. & Co.

Stearine—
Belgium, 63 bgs. H. Hill & Sons
,, 60 ,,
France, 70 ,,

Sodium Nitrate—
Holland, £50 J. Owen
,, 50 ,,

Sugar of Lead—
Germany, £120 C. J. Capes & Co.
France, 10 pks. ,,

Sodium Acetate—
Belgium, 9 pks. A. Zumbeck & Co.

Sodium Hypophosphate—
Holland, £51 J. James & Son

Salt—
Portugal, 200 t. Pillow, Jones & Co.

Saltpetre—
Germany, 80 cks. J. Hall & Son
E. Indies, 207 C. Wimble & Co.
,, 1,202 bls. ,,
Germany, 100 cks. T. Merry & Son

Tar—
Germany, 200 brls. Linck, Moeller & Co.
Nykarleby, 1,192 ,,
Uleaborg, 1,230 ,,

Turpentine—
U.S., 1,667 brls. Nickoll & Knight
,, 1,000 Game, Bowes & Co.
N. Russia, 52 C. B. Leighton
Savannah, 2,500 Nickoll & Knight

Tartaric Acid—
Holland, 10 pks. Middleton & Co.
Austria, 1 M. D. Co.
France, 12 B. & F. Wf. Co. Ld.

Ultramarine—
Holland, 10 cs. Hernu, Peron & Co.
,, 4 cks. Spies Bros. & Co.
,, 10 cs. G. Steinhoff
,, 10 Hernu, Peron & Co.
,, 16 cks. Little & Johnston
Germany, 42 cs. 4 cks. G. Steinhoff

Zinc Oxide—
Holland, 300 cks. Soundy & Son
,, 200 M. Ashby, Ld.
,, 70 Prprs. of Dowgate Dk.
U.S., 200 brls. M. Ashby, Ld.
Holland, 50 ,,

LIVERPOOL.

Week ending Sept. 30th.

Alcohol—
Hamburg, 9 hds.
,, 2 cks.

Acetic Acid—
Rotterdam, 10 bskts.

Acetate of Lime—
St. Nazaire, 84 sks.

Ammonia—
New York, 45 cs.

Boracic Acid—
Leghorn, 30 cks. Shropshire Union Co.
,, 20 ,,

Bones—
Baltimore, 366 bgs.
Gijon, 90 t. H. Rooke & Co.
Boston, 175 sks, J. E. Gordon

Borax—
Valparaiso, 1,085 sks.

Charcoal—
St. Nazaire, 650 sks.

Copper Precipitate—
Lestri Levante, 50 brls. H. Bath & Sons

Caoutchouc—
Pernambuco, 2 bls. 50 brls. 1 pg.
Grand Bassam, 5 cks. F. & A. Swanzy
,, 16 cs. 5 W. D. Woodin
,, 21 ,,
,, 5 A. Millerson
,, 2 Pitt Bros.
,, 3 F. Schaeffer & Co.
,, 3 3 Pickering & Berthond
,, 1 S. & C. Nordlinger
,, 1 T. E. Tomlinson & Co.
,, 1 Unvrsl. Coml. Bank
,, 1 Edward's Bros.
,, 1 A. Reis
,, 1 Radcliffe & Durant
,, 2 3 Millward Bradbury

Caoutchouc—*continued.*
Assinee, 11 cs. 3 cks. Pickering & Berthond
,, 11 3 F. & A. Swanzy
,, 1 3 A. Verdier
,, 2 9 Millward Bradbury
,, 3 1 W. D. Woodin
,, 2 ,,
,, 1 1 Ellis & Co.
,, 5 A. Herschell
,, 1 Pitt, Bros. & Co.
,, 2 A. Millerson & Co.
,, 3 T. Schaeffer & Co.
,, 4 Edwards Bros.
,, 1 Radcliffe & Durant
Ambriz, 57
,, 7 Cie. Francaise & Co.
Salt Pond, 8 C. Rotteman
,, 1 W. Griffiths & Co.
,, 1 W. B. McIver & Co.
,, 2
,, 2 Havard & Co.
,, 1 2 Grimwade Ridley
,, 1 1 A. Herschell
,, 1 7 W. D. Woodin
,, 13 A. Miller, Bros. & Co.
,, 7 9 Pickering & Berthond
,, 2 12 Radcliffe & Durant
,, 5 9 Edwards Bros.
Cape Coast, 15 A. Miller, Bros. & Co.
,, 3 Mordant Bros.
,, 1
Ceara, 10 bls. R. Singlehurst & Co.
,, 9 Gunston, Sons & Co.
,, 6 Bieber & Co.
Quitta, 8 J. H. Rayner & Co.
Accra, 44 J. P. Werner
,, 8 F. & A. Swanzy
,, 35 J. J. Fischer & Co.
,, 10 Hutton & Co.
,, 1 Davies, Robbin & Co.
,, 1 7
,, 3 Edwards Bros.
,, 1 3 cks. Pickering & Berthond

Cream of Tartar—
Barcelona, 12 kgs.
Tarragona, 2 cks.

Copper Ore—
Lisbon, 53 t. Harrington & Co.

Chemicals *(otherwise undescribed)*
Rotterdam, 1 ck.

Dyestuffs—
Divi Divi
Amsterdam, 77 bgs. Brown, Gevcke & Co.
Yellow Berries
Smyrna, 20 bgs. R. Shaw & Co., Ltd.
,, 50 ,,
Sumac
Barcelona, 50 bgs. A. Ruffer & Sons
Cochineal
Grand Canary, 8 bgs. Swanston & Co.
,, 6 F. W. Wood & Co.
Teneriffe, 25 German Bank, England
,, 8 Kahner & Henderson
Extracts
New York, 100 bxs.
Valonia
Patras, 104 bgs.
,, 92 G. E. Sparapoule
,, 84 P. F. Mansachi
Fustic
Patras, 23½ t.
Annatto
Bordeaux, 3 cks.
Alizarine
Rotterdam, 4 cks.

Glycerine—
Amsterdam, 35 cs. 15 crbys.
Rotterdam, 5 blins.
Hamburg, 5

Glucose—
New York, 100 brls.
Graphite—
Fiume, 20 cs.
Iodine—
Valparaiso, 81 brls. A. Gibbs & Sons
" 24 San Sebastian Nitrate Co.
Manganese Ore—
Oporto, 120 t. Redfern, Alexander & Co.
Gothenburg, 100
Poti, 2,750 Wigan Coal & Iron Co.
Mica—
Boston, 1 cs.
Manganese Chlorate—
Rotterdam, 2 cks.
Naphtha—
New York, 8 dms.
Potash Salts—
Hamburg, 1,205 bgs.
" 585
Plumbago—
Hamburg, 43 cks.
Phosphate—
Montreal, 185 t.
Ghent, 2,000 bgs. 400 t.
Pyrites—
Huelva, 1,520 t. Tennants & Co.
" 1,548 Matheson & Co.
" 1,590 "
" 1,020 "
Soapstone—
Bordeaux, 100 bgs. G. G. Blackwell
" 50 bxs. "
Genoa, 200 bgs. W. Harrison & Co.
" 500 G. G. Blackwell
Sulphur—
Catania, 100 bgs. 47 brls. 75 t.
Soda—
Rotterdam, 3 cks.
Salammoniac—
Amsterdam, 2 cs.
Saltpetre—
Hamburg, 50 cks.
" 22
Soap—
New York, 100 cs.
Leghorn, 525 bxs. Weaver & Sterry
Rotterdam, 40 cs.
St. Nazaire, 10
Antwerp, 4 J. T. Fletcher & Co.
Sulphur Ore—
Huelva, 1,667 t. Matheson & Co.
Tartar—
Bordeaux, 37 cks.
Naples, 7 Brown Bros.
Tartar Salts—
Rotterdam, 10 cks.
Ultramarine—
Rotterdam, 5 cks.
Verdigris—
Bordeaux, 2 cks.
Zinc Oxide—
St. Nazaire, 10 brls.
Antwerp, 30 J. T. Fletcher & Co.
" 25
Barcelona, 41
Terneuzen, 50

GLASGOW.

Week ending October 2nd.

Dyestuffs—
Madders
Rotterdam, 1 cs. 1 prcl. J. Rankine & Son
Extracts
Antwerp, 11 cks. 1 cs.
Alizarine
Rotterdam, 140 cks. 2 cs. J. Rankine & Son
" 372 "
Nickel Ore—
Tchio, 374 t.
" 1,053 1 cs.
Phosphate—
Antwerp, 100 t.
Sodium Bichromate—
Rotterdam 10 cks. J. Rankine & Son
Sodium Nitrate—
Pisagua, 1,265 t. Thomson, Aikman, & Co.
Salt—
Hamburg, 325 t. A. Cros & Son
Soap—
New York, 400 bxs.
Ultramarine—
Antwerp, 10 cs.
Zinc Oxide—
Antwerp, 10 brls.
Rotterdam, 76 cks. J. Rankine & Son

GRIMSBY.

Week ending September 27th.

Chemicals *(otherwise undescribed)*
Hamburg, 6 pks.
Antwerp, 11
Glucose—
Hamburg, 12 cks.
Glycerine—
Rotterdam, 10 pks.
Zinc Ashes—
Antwerp, 25 cks.

HULL.

Week ending October 2nd.

Arsenic—
Hamburg, 1 ck. Aire & Calder N. Co.
Acetic Acid—
Rotterdam, 1 ck. Hutchinson & Son
Barytes—
Antwerp, 19 cks. 100 bgs. Bailey & Leetham
Bremen, 14 cks H. T. Greves & Co.
" 22 T. W. Flint & Co.
Chemicals *(otherwise undescribed)*
Antwerp, 74 pks. Wilson Sons & Co.
Hamburg, 160 "
Rouen, 12 cks. Rawson & Robinson
Bremen, 2 10 cs. Veltmann & Co.
Dyestuffs—
Logwood
Boston, 25 brls.
Alizarine
Rotterdam, 3 cks. Hutchinson & Son
" 41 pks. W. & C. L. Ringrose
" 52 cks. 4 cs. Hutchinson & Son
" 13 W. & C. L. Ringrose
" 33 pks. "
" 32 Hutchinson & Son.
Madders
Rotterdam, 3 cks. W. & C. L. Ringrose
Glucose—
Rotterdam, 60 bgs. Hutchinson & Son
" 100 bgs. Hutchinson & Son
" 40 "
Stettin, 450 Wilson Sons & Co.
" 1,200 C. M. Lofthouse & Co.
New York, 120 brls.
Glycerine—
Rotterdam, 2 cks. Hutchinson & Son
Muriate—
Rotterdam, 20 cks. G. Lawson & Sons
Manure—
Kainit
Hamburg, 128 t. G. Lawson & Sons
Phosphate Rock
Port Royal, 3,200 t.
Phosphorus—
Rouen, 25 cs. Rawson & Robinson
Soap—
New York, 525 pks.
Turpentine—
Bordeaux, 10 cks. Rawson & Robinson
Ultramarine—
Rotterdam, 10 cs. Hutchinson & Son
Waste Salt—
Hamburg, 203 bgs. Furley & Co.
" 510 bgs.

GOOLE.

Week ending Sept. 24th.

Antimony—
Boulogne, 3 cks.
Creosote Salts—
Rotterdam, 46 cks.
Caoutchouc—
Boulogne, 12 cks. cs.
Dyestuffs—
Alizarine
Rotterdam, 51 cks.
Logwood
Belize, 362 t.
Fustic
Maracaibo, 153 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 30 cks. 10 cs. 2 pks.
Glucose—
Hamburg, 38 cks.
Dunkirk, 200 bgs.
Naphthylamine—
Rotterdam, 2 cks.
Potash—
Calais, 31 brls.
Dunkirk, 29 cks.
Phosphate—
Ghent, 800 bgs. 160 t.
Saltpetre—
Rotterdam, 100 bgs.
Sugar of Lead—
Rotterdam, 28 cks.
Soda—
Rotterdam, 10 cks.
Tartaric Acid—
Rotterdam, 13 pks.
Waste Salt—
Hamburg, 784 t.

TYNE.

Week ending October 1st.

Acetic Acid—
Rotterdam, 67 btls. Tyne S. S. Co.
Copper Regulus—
Huelva, 104 t. H. Scholefield & Son
Copper Precipitate—
Huelva, 249¼ t. Bede Chem. Co.
Phosphate—
Montreal, 200 t.
Sulphur Ore—
Drontheim, 200 t.
Zinc Oxide—
Antwerp, 25 brls. Tyne S. S. Co

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending September 24th.

Arsenic—
Sydney, 1 t. £15
Ammonia—
Cadiz, 1 t. £50
Ammonium Sulphate—
Hamburg, 200 t. £2,400
Ammonium Carbonate—
Cape Town, 3 cks. £5
Montreal, 34 pks. 90
Bordeaux, 1 t. 2 c. 33
St. Petersburg, 10 cks. 45
Bisulphide of Carbon—
Rotterdam, 51 c. £31
Borax—
Rotterdam, 26 £40
Wellington, 9 kgs. 1 ck. 50
Bone Ash—
Sydney, 4 cks. £15
Caustic Soda—
New Orleans, 11 t. 17 c. £135
Adelaide, 12 17 111
Brisbane, 5 21
Corrosive Sublimate—
Madras, 3 c. £35
Citric Acid—
Sydney, 40 kgs. £192
Riga, 1 ck. 8
Barcelona, 1 37
Stettin, 5 c. 36
Barcelona, 19 140
Batoum, 5 kgs. 36
Moscow, 1 t. 149
Cream of Tartar—
Hobart, 10 cs. £61
Wellington, 12 c. 60
Adelaide, 25 138
Dunedin, 10 74
Melbourne, 30 165
" 1 t. 12 154
Dunedin, 10 68
Lyttelton, 10 56
Launceston, 5 28
Melbourne, 1 104
Rockhampton, 10 54
Brisbane, 1 102
Copper Sulphate—
Adelaide, 5 t. £97
Venice, 10 190
Sydney, 2 36
Lyttelton, 3 56
Lisbon, 10 16 c. 174
Naples, 3 15 65
Coal Products—
Alizarine
Boston, 13 cks. £210

Coal Products—*continued.*
Toluole
Rotterdam, 25 £313
Pyridine Bases
Hamburg, 24 cks. £173
Naphthaline
Rotterdam, 40 cks. 30
Anthracene
Dusseldorf, 64 cks. £344
Cologne, 36 sks. £772
Benzole
Rotterdam, 55 pks. £702
Tar
Bordeaux, 6 cks. £5
Bombay, 35 rlts. 26
Karachi, 61 39
Calcutta, 400 210
Abo, 600 bls. 272
Pitch
Antwerp, 415 t. £550
Berdeaux, 12 cks. 8
Philadelphia, 2,250 t. 3,807
Duisburg, 126 167
Naples, 1,626 2,439
" 270 93
Treport, 17 bls. 18
Calcutta, 50 rlts. 24
Cadiz, 1,010 t. 1,616
Abo, 70 94
Antwerp, 145 192

Chemicals *(otherwise undescribed)*
Wellington, 6 cs. £9
Natal, 4 6
" 2 pks. 4
Cape Town, 23 73
Valparaiso, 4 73
Auckland, 3 27
Melbourne, 116 123
" 1 5
Barcelona, 12 25
Melbourne, 1 tank 28
Disinfectants—
Oporto, 12 c. £20
Sydney, 30 cks. 58
Calcutta, 6 cs. 42
Guano—
Guadeloupe, 100 t. £1,000
Barbadoes, 100 1,000
Martinique, 10 100
Amsterdam, 30 300
Manure—
Dunedin, 100 t. £1,352
Natal, 4 c. 3
Treport, 20 150
Dunkirk, 30 360
Trinidad, 10 6 36
Genoa, 100 350
Alicante, 94 6 735
Hamburg, 68 18 500
Valencia, 113 3 904

Pottassium Bromide—
Yokohama, 25 cs. £183
Phosphoric Acid—
New York, 15 cs. £87
Pottassium Cyanide—
New York, 12 c. £52
Shanghai, 7 21
Potassium Chlorate—
Malta, 3 c. £8
Boston, 7 t. 10 341
Shanghai, 15 kgs. 66
Soda Crystals—
Hobart, 3 t. 1 c. £11
Superphosphate—
Martinique, 20 t. £80
Sodium Bicarbonate—
Townsville, 25 c. £8
Lyttelton, 5 t. 30
Sydney, 1 5 25
Superphosphate of Lime—
Lisbon, 3 t. 5 c. £295
Sulphuric Acid—
Cape Town, 5,402 lbs. £17
Sheep Dip—
Auckland, 1 t. 8 c. £62
Algoa Bay, 11 3·12
,, 350 gls. 70
Sulphur Flowers—
Cape Town, 1 t. 19 c. £21
Saltpetre—
Rio de Janeiro, 2 t. 8 c. £50
Lyttelton, 2 46
Oporto, 8 5 170
Ghent, 10 15
Oporto, 5 9 112
Salammoniac—
Gothenburg, 1 t. 3 c. £40
Tartaric Acid—
Hobart, 5 cs. £37
Wellington, 11 c. 65
Keppel Bay, 1 7
Adelaide, 30 212
Dunedin, 5 46
Melbourne, 30 195
Rotterdam, 2 15
Dunedin, 5 40
Lyttelton, 5 34
Melbourne, 1 t. 5 175
Rockhampton, 5 36

LIVERPOOL.

Week ending Sept. 27th.

Alkali—
Genoa, 11 tcs.
Philadelphia, 25
Odessa, 150 brls.
St. Petersburg, 80 cks.
Alum Cake—
Calcutta, 12 t. 9 c. £46
Philadelphia, 7 3 22
Ammonium Muriate—
Havre, 1 t. 1 c. 1 q. £22
New York, 9 1 220
Melbourne, 12 15
B. Ayres, 5 12 72
Ammonium Sulphate—
Bengal, 1 q. £5
Mauritius, 25 t. 2 c. 3 316
Bordeaux, 10 9 3 120
Hamburg, 50 4 1 580
New York, 19 19 3 230
Antimony Regulus—
Santander, 4 c. £17
Nantes, 1 t. 1 q. 70
Hamburg, 1 73
Alum—
Santander, 4 t. 2 c. 2 q. £21
Montreal, 5 9 27
Alexandria, 6 12 2 34
Calcutta, 5 2 26
Portland, 41 8 109
Constantinople, 13 6 2 69
Madras, 28 2 181
Valencia, 5 3 1 17
Rangoon, 4 2 1 21
Syra, 3 1 15
,, 1 9 8
Dunedin, 2 2 2 7
Baltimore, 39 1 1 469
Ammonium Carbonate—
Venice, 19 c. 2 q. £34
Copenhagen, 3 1 6
Danzig, 5 9
Odessa, 1 t. 33
Genoa, 2 7 85
Riga, 6 9
San Sebastian, 10 16
Santander, 10 16
Venice, 10 14
Nantes, 3 100
Bone Waste—
Rouen, 7 t. 10 c. £45
Bleaching Powder—
Antwerp, 33 cks.
Baltimore, 66
Bilbao, 26
Boston, 444
Hamburg, 80
New York, 2
Trieste, 28
Vera Cruz, 15 brls.
Calcutta, 139 cs.
Genoa, 354
Hamburg, 72
Hong Kong, 50
Malaga, 30
Nantes, 7 17
Oporto, 13
Philadelphia, 122 tcs.
Portland, 100
Rio de Janeiro, 10 cs.
Santos, 22 cks.
Seville, 25
Vera Cruz, 20 cs.
Borate of Lime—
Rotterdam, 10 t. 3 c. £110
Borax—
Antwerp, 2 t. 2 c. £62
New York, 1 10 41
Rotterdam, 1 3 q. 6
Oporto, 5 1 7
Seville, 9 13
Melbourne, 2 5 65
Odessa, 4 17 116
Caustic Soda—
Almeria, 15 dms.
Antwerp, 27 brls.
Bahia, 20 kgs. 30
Barcelona, 45
Boston, 400
Carthagena, 127
Cienfuegos, 20
Corunna, 20
Dunedin, 16
Fairwater, 16
Galatz, 40
Las Palmas, 8
Melbourne, 36
New York, 1,248
Pernambuco, 50
Philadelphia, 100 135
Piræus, 20
Puerto Cabello, 15
St. Petersburg, 1,500
Santander, 20
Seville, 100
Sydney, 30
Tampico, 325 kgs.
Valencia, 90
Algiers, 10
Bahia, 40
Barcelona, 100
Batoum, 70
Boston, 400
Carril, 6
Chicago, 25
Corfu, 50
Dunedin, 33
Fiume, 46
Galatz, 100
Genoa, 197
Lisbon, 36
Malaga, 20
Messina, 40
Montreal, 63 cks. 250
Nantes, 87
Naples, 15
New Orleans, 59
Odessa, 475
Oporto, 10
Para, 16
Pernambuco, 10
Philadelphia, 50
Portland, 150
Quebec, 300 kgs. 25
Rosario, 250
Rotterdam, 10
Sagua la Grande, 6
Savanilla, 25
Seville, 45 cks. 255
Singapore, 15
Venice, 39
Vigo, 5
Wellington, 16
Yokohama, 100
Calcined Magnesia—
Oporto, 1 q. £29
Caustic Potash—
Havana, 4 c. £7
Newfairwater, 5 6
Montreal, 3 t. 7 67
New York, 7 140
Chicago, 1 1 24
Montreal, 1 11 36
Cream of Tartar—
St. Johns, N. F. 9 c. 2 q. £48
Copperas—
San Francisco, 21 t. 1 c. £50
Larnaca, 3 16 8
Syra, 2 6 1 q. 5
Alexandria, 14 15 30
San Francisco, 3 5 7
Copper Sulphate—
Naples, 16 c. £17
Genoa, 34 t. 18 1q. 597
Havana, 1 10 29
St. Nazaire, 2 13 58
Montreal, 1 17
Otago, 10 8
Bordeaux, 10 1 174
B. Ayres, 2 19 69
Seville, 8 3 153
Singapore, 3 6 62
New York, 2 9 1 45
Ancona, 5 4 2 105
Antwerp, 4 19 3 90
,, 9 17 2 174
Rotterdam, 5 1 90
Bombay, 10 201
Bordeaux, 22 17 375
Calcutta, 5 92
St. Petersburg, 35 7 1 665
Bilbao, 30 4 2 516
Bordeaux, 36 12 1 657
Nantes, 6 13 163
Oporto, 2 42
Alexandria, 14 2 19
Salonica, 2 2 35
Bordeaux, 19 17 1 377
Santander, 10 2 184
Rouen, 87 6 1,658
B. Ayres, 3 55
Galatz, 10 10
Hamburg, 5 11 1 97
Leghorn, 5 9 3 97
Bari, 2 5 1 41
Ancona, 12 15 3 202
Venice, 17 9 3 330
Sydney, 5 100
Montreal, 2 5 3 42
Melbourne, 8 155
Copenhagen, 9 8
Konigsburg, 2 43
Riga, 1 16 31
Copenhagen, 4 2 4
New Fairwater, 10 2 179
Nantes, 9 12 2 168
Calcium Chloride—
Wellington, 2 t. 10 c. £5
Carbolic Acid—
Rangoon, 1 t. 7 c. 2 q. £17
Vera Cruz, 1 3 1 50
Hamburg, 1 1 67
New York, 3 255
Genoa, 9 39
Yokohama, 4 1 22
Hamburg, 7 19 595
Barcelona, 1 3 3 50
New York, 2 8 3 110
Chemicals *(otherwise undescribed)*
Danzig, 5 c. £5
Patras, 2 t. 15 6
Vera Cruz, 8 27
Santander, 2 55
Disinfectants—
Bombay, 1 cks. £13
Shanghai, 4 cs. 21
Epsom Salts—
Bombay, 100 kgs.
St. Johns, Nfld. 4 cks.
Bahia, 10 brls
Guayaquil, 10 cs.
Santander, 13
Guano—
Mollendo, 1 t. 9 c. £14
Barcelona, 73 16 1 q. 719
Valencia, 201 10 2 1,968
Gypsum—
New York, 10 t. 2 q. £30
Glycerine—
Hamburg, 5 t. 12 c. £135
,, 5 13 110
Rotterdam, 10 3 205
Iron Oxide—
Melbourne, 1 t. 1 c. 1 q. £17
Magnesium Chlorate—
Singapore, 11 c. £6
Madras, 2 t. 1 6
Manure—
Bordeaux, 100 t. 5 c. 3 q. £668
St. Nazaire, 1,001 3 3 5,579
Havre, 350 4 3 1,949
Nantes, 57 10 329
Gr. Canary, 25 6 85
Magnesia—
Maranham, 2 cs.
Nitric Acid—
Callao, 3 c. 3 q. £1
Phosphorus—
Havana, 13 c. 2 q. £150
Vera Cruz, 16 1 80
Pitch—
Ancona, 958 t.
Potassium Bichromate—
Barcelona, 10 t. £310
Potassium Carbonate—
Boston, 9 t. £126
New York, 7 10 c. 105
Chicago, 2 18 40
Potashes—
M. Video, 11 c. £13
New Orleans, 10 43
B. Ayres, 1 t. 1 33
Genoa, 11 15
Potassium Chlorate—
Odessa, 10 c. £24
Boston, 1 t. 5 60
Hamburg, 15 35
Copenhagen, 15 700
Gothenburg, 5 1 212
Yokohama, 7 10 330
New York, 5 210
Naples, 6 14
Yokohama, 20 92
Oporto, 2 10 125
Vera Cruz, 10 83
Vigo, 1 45
New York, 10 500
St. Petersburg, 10 466
Genoa, 15 35
Hiogo, 10 435
Shanghai, 7 10 350
Manganillo, 9 21
Potassium Bicarbonate—
Leghorn, 2 t. 10 c. £80
Potassium Cyanide—
Trinidad, 6 c. £7
Phosphate—
Valencia, 3 t. 14 c. 2 q. £17
Salt Cake—
Philadelphia, 22 t. 10 c. £40
Salt—
Addah, 8 pns. 5 t.
Antwerp, 120
Benin, 40
Bonny, 135
Boston, 100
Brussels, 8
Buguma, 20
E. London, 40
Halifax, 350
Isles de Los, 101
Iceland, 112
M. Video, 8 c.
Port Natal, 20
San Francisco, 100
San Juan, 10
Tonsberg, 250
Vera Cruz, 10
Warre, 40
Antwerp, 155
Baltimore, 104
Belize, 15
Cameroons, 55½
Chicago, 130
Dunedin, 15
Montreal, 584
Para, 17 3
Rotterdam, 374
Callao, 2
Soda Ash—
Baltimore, 908 cks.
Barcelona, 100 brls.
Boston, 1,400 bgs. 127
B. Ayres. 300
Calcutta, 40
Callao, 20
Galatz, 15
Lisbon, 35
Melbourne, 351
New York, 304 tcs. 82
Philadelphia, 844
Piræus, 35
Toronto, 170
Valparaiso, 10
Baltimore, 221
Beyrout, 50
Boston, 29 dms 492 129 tcs.
B. Ayres, 100 brls.
Chicago, 39
Constantinople, 100
Corfu, 60
Mitylene, 106
Montreal, 19 tcs.
New York, 185
Philadelphia, 65
Rio de Janeiro, 5
Seville, 20
Smyrna, 200
Syra, 250
Venice, 8

Soda Crystals—
Boston, 280 brls.
Calcutta, 50 kgs. 65 brls.
M. Video, 8 cks.
New York, 250
Philadelphia, 280
Samarang, 179 kgs.
Rourabaya, 25
Beyrout, 10 brls.
Brisbane, 100
Malta, 100
Montreal, 50
New York, 30 250 cks.
Seville, 20
Smyrna, 50 50

Soap—
Bombay, 25 bxs. 52 cs.
Boston, 20
Calcutta, 20
Caldera, 1
Carthagena, 25
Cornito, 4
Genoa, 155
Jeremine, 2
Kurrachee, 5
Mostel Bay, 25
Port Said, 5
Trinidad, 2
Warre, 200
Accra, 51
Alexandria, 5
Antwerp, 480
Barbadoes, 650
Bathurst, 14
Bombay, 1,768
Bonny, 900
Calcutta, 6 250 pks.
Chama, 25
E. London, 12
Gibraltar, 250 4
Hong Kong, 200
Honolulu, 40
Iquique, 1
Kingston, 1
Old Calabar, 2,100
Panama, 1
Para, 150
Piræus, 20
Port Natal, 387
Sierra Leone, 100
Toronto, 200

Sodium Silicate—
Constantinople, 8 brls.
Barranquilla, 5 cks.
Leghorn, 32
Lisbon, 26
Montreal, 10
Melbourne, 20
Valencia, 15

Sodium Bicarbonate—
Amsterdam, 50 kgs.
Antwerp, 10 cks. 32
Bilbao, 10
Calcutta, 1,350
Charlotte Town, 30
Constantinople, 20
Genoa, 50
Hamburg, 100
Honolulu, 20
London, 5 50
Montreal, 20
Nantes, 10
Naples, 10
Odessa, 200
Rosario, 100
Syra, 20
Wellington, 50
Ghent, 5
Antwerp, 40
Bombay 117
Calcutta, 1,000
Marseilles, 75
Portland, 25 cks. 150
Seville, 40 4 brls.
Sydney, 20

Sodium Carbonate—
Boston, 56 brls.

Sodium Biborate—
Hamburg, 10 t. 19 c. 3 q. £329
Rotterdam, 2 4 3 118

Sodium Bichromate—
Havre, 10 t. 7 cs. £250
Piræus, 5 1 q. 120

Sodium Hyposulphite—
Portland, 1 t. £56

Sodium Acetate—
New York, 5 t. 12 c. £92

Salammoniac—
New York, 6 t. 7 c. £210
Beyrout, 14 2 q. 26
Alexandria, 3 14 2 164
Constantinople, 12 21
Piræus, 4 7
Genoa, 2 5 76
Naples, 3 6
Syra, 10 17

Salammoniac— *continued.*
Marseilles, 7 c. 1 q. 16
Braila, 14 3 23
Vigo, 3 1 6

Saltpetre—
Maranham, 5 c. 2 q. £7
Syra, 2 t. 1 42
B. Ayres, 2 50
Callao, 1 10 33

Sheep Dip—
Algoa Bay, 1 t. 8 c. £51
Cape Town, 5 178
Natal, 613 drs. 179
Odessa, 3 8 1 131

Sodium Chlorate—
Hamburg, 10 c. £28
Stettin, 1 t. 56
New York, 2 10 157
Hamburg, 1 9 82

Sulphur—
Havana, 1 t. £8
Montreal, 43 3 q. 198
Havana, 1 2 c. 2 7
Pernambuco, 1 2 3 8
New York, 50 2 225

Sodium Nitrate—
Malaga, 16 t. 7 c. 1 q. £143
Valencia, 1 4 1 10
New York, 1 16 2 56
" 2 5 3 60
Carthagena, 5 3 44

Sugar of Lead—
Rio de Janeiro, 5 c. 2 q. £8

Tar—
St. Johns, Nfld., 65 brls.

GLASGOW.

Week ending October 2nd.

Bones—
Antwerp, 5 t. £27. 10s.

Benzole—
Dieppe, 32 pns. 50 brls. £506

Borax—
Rotterdam, 1 ck. £11

Copperas—
Kurrachee, 14 t. 14 c. £40. 10s.

Chemicals *(otherwise undescribed)*
Kurrachee, 139¾ c. £78

Dyestuffs—
Madders
Dunedin, 25 c. £46
Logwood
Dunedin, 13 t. 16½ c. £144
Quebec, 236½ 102
Extracts
Montreal, £118
Quebec, 22½ 36

Litharge—
Montreal, 8 t. 18½ c. £145
Kurrachee, 29 £21. 10s.

Muriatic Acid—
Kurrachee, 6 t. 16 c. £28

Nitric Acid—
Kurrachee, 32¼ c. £22

Pitch—
Amsterdam, 200 t. £200
Kurrachee, 21 10 c. 53

Potassium Carbonate—
Kurrachee, 1 t. 11¾ c. £29

Paraffin Wax—
Dunedin, 12¾ t. £400
Antwerp, 5 1 c. 147
Japan, 8 8 130

Potassium Bichromate—
Dunedin, 15½ c. £26
" 17¼ c. £27. 10s.
Antwerp, 379 495
Christiania, 7 cks. 79
" 1 7
" 6 £64. 10s.
Boston, 72 120
Rotterdam, 27 280
" 6 89
Kurrachee, 3 t. 18¾ 121
Quebec, 9 13½ 325

Sodium Bichromate—
Antwerp, 9 t. 16 c. £227
Kurrachee, 41 £44. 16s.

Soap—
Calcutta, £42. 15s.

Sulphuric Acid—
Kurrachee, £282

Sugar of Lead—
Kurrachee, 6 t. 4½ c. £105

Tar—
Natal, 10½ c. £6. 4s.
Calcutta, 151

Tartar—
Dunedin, 5 c. £26

GOOLE.

Week ending Sept. 24th.

Alum—
Rouen, 5 bgs.

Alkali—
Antwerp, 4 cks.
Dunkirk, 30 drms.

Benzole—
Calais, 24 cks.
Rotterdam, 20

Coal Products—
Calais, 25 cks.
Ghent, 19
Rotterdam, 109

Chemicals *(otherwise undescribed)*
Boulogne, 12 cks.
Hamburg, 102

Dyestuffs *(otherwise undescribed)*
Boulogne, 3 cks. 2 cs.

Manure—
Boulogne, 24 bgs.

Pitch—
Antwerp, 316 t.

HULL.

Week ending Sept. 30th.

Alkali—
New York, 88 cks.
Uleaborg, 1
Wasa, 5

Borax—
Drontheim, 2 cks.

Bone Size—
Harlingen, 10 cks.
Rotterdam, 2

Bleaching Powder—
Abo, 30 cks.
Copenhagen, 1
Drontheim, 38

Caustic Soda—
Konigsberg, 33 drms.
Riga, 100
Taganrog, 345
Wasa, 13 cks.

Copper Sulphate—
Riga, 10 cks.

Chemicals *(otherwise undescribed)*
Alexandria, 24 cs. 13 cks.
Abo, 33
Antwerp, 26 30
Amsterdam, 6 8 pks.
Bergen, 20
Bremen, 12
Christiania, 10 30
Copenhagen, 4 30
Danzig, 100
Drontheim, 2
Dunkirk, 80
Gothenburg, 19 9 14
Hamburg, 123 5 12 blts.
Konigsberg, 19 40 pks.
Libau, 15 80
New York, 25
Rotterdam, 8 1
Riga, 2 1 1
Stockholm, 1
St. Petersburg, 21 1
Uleaborg, 1
Wasa, 36

Dyestuffs—
Sumac
Christiania, 36 c.
Dyestuffs *(otherwise undescribed)*
Antwerp, 1 kg. 6 cks.
Christiania, 24 bgs.
Hamburg, 4 18 2 cs.
Rotterdam, 1 drm.
Riga, 1 40
Stettin, 180
St. Petersburg, 1 cs.

Horn Piths—
Hamburg, 25 pks.

Manure—
Hamburg, 200 bgs.
New York, 26 t.
Rouen, 228

Pitch—
Alexandria, 5 cks.
Antwerp, 347 t.

Salt—
Copenhagen, 5 t.

Tar—
Alexandria, 3 cks.
Amsterdam, 3
Danzig, 1
Hamburg, 3
Uleaborg, 8

GRIMSBY.

Week ending Sept. 27th.

Coal Products—
Dieppe, 54 cks.

Chemicals *(otherwise undescribed)*
Dieppe, 4 cs.
Rotterdam, 14 10 cks.

TYNE.

Week ending October 1st.

Alum Cake—
Odense, 10 t. 6 c.

Alkali—
St. Petersburg, 56 t. 6 c.
Stettin, 11 6
Bergen, 2 15
Antwerp, 1 2
Rotterdam, 1 12
Riga, 6 18

Ammonium Sulphate—
Valencia, 50 t.

Barytes Chlorate—
Hamburg, 5 c.

Barytes Carbonate—
Stettin, 9 t. 10 c.
" 101 11
Copenhagen, 10
Rotterdam, 755

Bleaching Powder—
Riga, 50 t. 3 c.
St. Petersburg, 89 17
Stettin, 118 5
" 16 3
Christiania, 25 2
Antwerp, 38 10
" 11 3
Hamburg, 58 8
" 10 3
Malmo, 12 9
Libau, 25 6
Naples, 2 4
Oporto, 9 19
Rotterdam, 8 18
" 11 7
" 2 12
Riga, 10 4

Blanc Fixe—
Antwerp, 4 t. 4 c.

Caustic Soda—
Riga, 30 t. 3 c.
Stettin, 17 8
Christiania, 6 18
Aalborg, 8 14
Antwerp, 10 4
Hamburg, 8 14
Copenhagen, 1 16
Leghorn, 10 3
Odense, 1 9
Riga, 30 3

Epsom Salts—
Hamburg, 1 c.

Iron Oxide—
Ceara, 15 t.

Litharge—
Christiania, 11 c.
Hamburg, 16
Copenhagen, 6
Gothenburg, 3 t. 3
Riga, 1 3

Magnesia—
Hamburg, 10 c.

Magnesium Carbonate—
Valencia, 14 c.

Oxalic Acid—
Odense, 7 c.

Superphosphate—
Esbjerg, 14 t. 14 c.

Soda Ash—
Aalborg, 2 t. 8 c.
Antwerp, 9 19
Libau, 10 6
Gothenburg, 30 8
" 50 6
Trieste, 10 6

Soda—
Christiania, 1 t. 2 c.
Horsens, 5 2
Aalborg, 26 10
Copenhagen, 26
Rotterdam, 11 17
Gothenburg, 10 1

Sodium Sulphate—
Gothenburg, 6 t.

Sulphur—
Gothenburg, 35 t.

Soap—
Copenhagen, 5 c.

PRICES CURRENT.

WEDNESDAY, October 8, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	57/6		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	1	0
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	6	6
,, (free from arsenic, 140/145°) .. .. ,,	1	10	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	10	0
Aniline Oil (pure) .. .. per lb.	0	0	11
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	5	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	4½
,, 50/90 ,, ... ,,	0	3	4
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¼
,, (crude 60°) .. .. per gallon	0	1	8
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	59	10	0
,, Sulphate .. .. ,,	19	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	16	0	0
,, Litharge Flake (ex ship) .. .. ,,	15	15	0
,, Acetate (white ,,) .. .. ,,	24	10	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	19	15	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	5	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	2
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	4½
Oils:—			
Cotton-seed .. .. per ton	21	0	0
Linseed .. .. ,,	25	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¼
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	3	15	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	10	0
,, Muriate, 80 % .. .. ,,	7	15	0
Silver (metal) .. .. per oz.	0	4	2½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	15	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	5	0
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6½
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	15	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	12	6
,, ,, (60 % Caustic Soda) .. .. ,,	10	12	6
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	17	6
,, Bicarbonate .. .. ,,	6	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	29	0	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	2	6
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	104	0	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	25	7	6
,, Chloride (solution, 96° Tw. .. .. ,,	6	7	6

THE

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Articles, reports, and correspondence on all matters of interest to the Chemical and allied industries, home and foreign, are solicited. Correspondents should condense their matter as much as possible, write on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication. Sketches should be sent on separate sheets.

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VOLATILE HYDROCARBONS AND FIRES.

NAPHTHA and similar hydrocarbons has played a somewhat prominent part in several recent fires. The fire which occurred in London on Monday, on the premises of Messrs. Rowley and Brock, accompanied as it was by such fatal results, and being due to the ignition of a liquid of which solvent naphtha was an important ingredient, shows the necessity for increasing precautions in dealing with a liquid so dangerously inflammable. Our readers will readily recognise this from the statement of the foreman who heard "a muffled report," an expression which very aptly conveys the sound produced by the ignition of the more volatile hydrocarbons, an ignition so sudden as to be fittingly described as incipient explosion, hence the "muffled report."

Not long since, another fire took place in a shed under the Vine-street Bridge of the Metropolitan Railway, and here naphtha was stored for the purposes of the company.

Naphtha is one thing, and petroleum another, but in the present connection we use, preferably, the expression, volatile hydrocarbons, to cover all substances of this type. There is an old saying, that a worse thing than sinning is being found out. In the cases referred to, the volatile hydrocarbon found the user out, but we wonder how many persons or firms there are in the kingdom who have been using, are using, and, in spite of those warnings, will continue to use these dangerous substances without due precautions, until they in their turn are found out by this most circumstantial evidence.

The legislature has endeavoured to grapple with the subject, scientific chemists have given it much consideration, and from a scientific standpoint, all that is necessary appears to have been accomplished. What is known as the ABEL close test, condemns a liquid as dangerous, when it shows that such liquid gives off imflammable vapour at a temperature below 75° Fahrenheit.

The present state of legislation is this: that if a person or firm is proved to possess quantities of such an inflammable liquid, without having a licence to do so, such persons or firms are liable to conviction, and the enforcement of penalties. It is scarcely to be expected that all firms using quantities of these hydrocarbons, will pay special visits to the authorities to inform them of the fact, and they do not receive an annual inquisition upon the subject like that, so familiar to Income Tax-payers. So there is nothing for it but the inspectors. This brings us to another point.

The inspectors had for sometime believed that petroleum was kept by railway companies in contravention of the law; but, having no right of entry to the suspected premises, they were unable to obtain evidence of the fact. Since the fire the inspectors have obtained what they regard as sufficient proof that the liquid in the shed at Vine-street was petroleum within the meaning of the Acts; but, as the whole of the suspected material was consumed by the fire in question, the flashing test, required by law, could not be applied.

If the inspectors are in this dilemma with such obvious users of hydrocarbons as railway companies, they must be

similarly placed with other firms. It is of course possible that they were not aware of the presence of dangerous hydrocarbons on the other premises in the country, at which fires have occurred.

This is a state of things which calls for an enlargement of the powers of inspectors. Casual criticism is of no avail. The subject wants to be pertinaciously hammered out, to be made a burning question in another sense, and the public should not lose their grip of it until some sufficiently effective method of dealing with it has become law. For our own part we do not see why, when these substances are used, as they appear to have been at Messrs. Rowley and Brock's, the vapours could not be drawn off from the operator, and discharged in some safe and suitable manner. And, again, we think that if some properly constituted authority received, what it considered, well-founded suspicions from an inspector, such authority might send in a requisition to the person or persons, on the same lines as the one sent requiring them to declare their incomes, so worded as to leave them no option but yes or no to the question "Do you store or use such and such substances?" We have sufficient faith in the public spirit of the average firms of the country to believe that they would honourably answer the question. And where the inspector had sufficient reason to believe the contrary, the law should give him the right of search under proper conditions. We will only add, that if makers of these articles issued a hand-bill with each lot, giving a list of their dangerous properties, risks, and precautions to be taken, it would do much to disseminate a better knowledge of their safe employment than is at present possessed by those who use them.

EXPLOSION AT THE SWINTON CHEMICAL WORKS.

EARLY on Saturday morning, the 11st inst, the unusual sound of the fire bell was heard at Mexbro'. It transpired that an explosion had occurred at the chemical works at Swinton, and that a great destruction of property had been the result. This was the third disaster at the works within a comparatively brief period. About a year ago a workman lost his life by the poisonous fumes emanating from one of the large vats in which he was working, and a mate was only "brought round" with great difficulty. Prior to this, a quantity of the inflammable liquid became ignited, and considerable loss was sustained by the owners, Messrs. Ellison and Mitchell, who also carry on similar works at Cleckheaton. It appears that about ten minutes to eight on Saturday morning, an employé named James Lawrence, of Doncaster, was on duty at the works. He had been firing up a still which was preparing about 3,000 gallons of benzoline. One of the proprietors would have been engaged near the same spot, in all probability, had he not met with a slight accident to one of his feet the previous day. He had interrogated Lawrence just before the accident as to whether all was right, and received a reply in the affirmative. Suddenly, however, there was a terrific report, with a simultaneous flash of fire, which appeared to envelope the whole premises. Before it was known what had happened, residents at Swinton and Kilnhurst had feared an explosion had occurred at the Thybergh Hall Colliery, and the wildest rumours were afloat. The workman, Lawrence, considers himself fortunate that he was not killed on the spot. When the explosion occurred he was not far from the still, and the concussion "carried" him several yards away. The flames caught him, and the partial disfigurement of his face is proof of the great danger he was in. It is remarkable that he was not more seriously injured. He was promptly removed to the hospital at Mexbro', after previous treatment by Dr. M'Call, of Kilnhurst, and it is hoped he may soon recover, the burns appearing to be only facial and superficial. He has sustained no internal injury, beyond the shock to the nervous system. Another workman named Joseph Lee was on the ground, but he escaped unscathed. As an illustration of the force of the explosion, the top of the still, constructed of half-inch boiler plates and said to weigh seven or eight tons, was carried through the air some 50 or 60 yards, finally alighting in a large tank of water. In its flight it just missed a tall chimney, which thus escaped demolition. The masonry of the benzoline shed—containing ten large boilers, capable of containing 3,000 gallons of liquid each—collapsed with a great crash, while the flames were darting heavenwards. The mechanism which ensured the security of the boilers also gave way, and the flames then consumed the benzoline inside. The boilers were fortunately by no means full, but there was ample liquid to cause a startling conflagration, which lasted a long time, until the benzoline had all been destroyed. There was no wind at the time, otherwise the consequence would have been much more disastrous. The width of the building was about 11 yards, and the length about 40 yards. When the members of the fire brigade arrived from Mexbro', their endeavour was to save that portion of the works which had thus far escaped. Between 30 and 40 benzoline barrels were on the ground, and these were removed to a safe distance from the fire. Water was poured upon the contiguous property in as large volumes as possible, though at the first the jet appeared very inadequate for the purpose. The labours of the brigade were not only arduous, but dangerous, while they stood in the vicinity of the blazing building, which every now and again gave ominous cracks, as though the whole would collapse. But no one was hurt. Captain Humphries (who is surveyor to the Mexbro' Local Board) had charge of the brigade. Amongst others who zealously assisted were Mr. H. A. Fenner, the company's analyst, Mr. W. H. Mitchell, and Mr. J. C. Haller, surveyor of the Swinton Local Board. Large crowds assembled from Mexbro', Swinton, and Kilnhurst, having been attracted by the fire bell and the flames. The extent of the damage is at present a matter of speculation, though it is calculated to amount to £2,000 or £3,000. The loss will be only very partially met by insurance. The cause of the explosion is not definitely known, but it is surmised that the "worm" at the top of the still had become clogged, thus preventing the escape of vapour from the benzoline, under which was the furnace.

INTERNATIONAL EXHIBITION OF MINING AND METALLURGY.

(From our London Correspondent.)

(Continued from Page 209.)

PASSING from the noise of the Machinery Hall, the well-arranged desert termed the west corridor, gives one a welcome sense of undisturbed quietude. The stand of the *Mining Journal*, which seems to have taken the exhibition under its special protection, gives evidence of being, at the worst, in a condition of suspended animation, as opposed to the state of total collapse, into which some of its neighbours have fallen, and yet there is much that is interesting. A glance at the catalogue sends the visitor straight to stand 4, belonging to the Uranium Mines, Ltd., in the hope of seeing specimens of the metal as ingot bar, or at least plating; his disappointment is complete, for the gold-coloured material which was said to be destined to replace most of the dearer metals is conspicuous chiefly by its absence. Specimens of Uranium salts there certainly are, but they are surprisingly similar to those from less sensational sources. The Aluminium Company, of Neuhausen, show some fine samples of aluminium and its alloys, the applicability of the former for art metal work being proved by some very tasteful statuettes with a matte surface. There is little doubt that aluminium, at least in the state of impurity, that at present seems inevitable, is a failure for purposes where a bright surface is required, but if a dull one be permissible, there is little to be said against it. A most interesting stand—and, of course, one entirely neglected—is that of Messrs. Chance Bros., who show recovered sulphur, sulphuric acid, made from sulphuretted hydrogen, as an alternative product, and samples of cement. With regard to the latter, but little can be said, as a few ounces of greyish powder unaccompanied by a series of briquettes and pats do not tell one much; but as far as can be judged by the colour of the specimens exhibited—by no means a bad criterion—cement makers on the Thames and Medway may at least pause ere they seek suicide in those pellucid streams; there is still some hope for them. Splendid specimens of antimony ore and antimony, the latter bearing the impress of purity on its face, in the shape of its characteristic star-like fracture, are shown by the Lixa Mining Co., Ltd.; while not far off is the "weather plant," perennial as the gigantic gooseberry, and having about as much connection with a mining exhibition. Now that white lead is attracting the attention of inventors and investors to an almost unprecedented degree, such an exhibit as that of the White Lead Company, Limited, cannot fail to be of interest. The company claims innocuousness for its product with some justice, as lead sulphate appears to be the principal constituent. The covering power is another matter altogether. One little "stand," in sore danger of being entirely overlooked, is a frame of photographs of the microscopic structure of steel of different degrees of hardness, annealed, tempered, and hardened, shown by F. Osmond, of Paris, whose researches have

perhaps contributed more to our knowlege of the nature of that mysterious material, than those of any of his co-workers in the field. The growing importance of boron in the form of its oxide, and the sodium salt formed therefrom, is proved by the excellent case filled with specimens of the products of the Borax Co., Ltd., and grumblers who object to it in their milk, must try to derive consolation from the lustre of the enamelled iron advertisement signs which it aids in producing. As for the rest of the exhibits in the west corridor, and the firms showing them, are they not written in the official catalogue of the Mining Exhibition?

New South Wales has been the mainstay of the whole undertaking. This is indubitable, as officials connected with the Government Commission, charged with its conduct, have said so themselves. Every imaginable mineral appears to exist, or have been found in New South Wales, and the mere catalogue of those shown would fill columns. The laity, with one accord, flock to the stands holding the gold specimens, and feast their eyes upon the "yellow dirt" from the time it emerges from the Chubb's safe, wherein it resides during the night, until its return thither, and is seen gazing at the colossal silver shaft, representing the output of the Broken Hill Proprietary Mine up to date. A custodian, by nature civil, but rendered surly by perpetual worrying by irresponsible *badauds*, guards the former, and will be relieved by the close of the Exhibition, and the termination of this torture.

A magnificent collection of New South Wales minerals, including such rarities as diamonds, tourmalines, and zircons, has been arranged by Professor Liversedge, of Sydney, but is, of course, ignored by the gazers aforesaid.

A glance round the galleries, shows endless cases of minerals, piles of ore, masses of building stones, and woods in endless variety, shown by the same colony, and similar exhibits by South Australia, South Africa, Scandinavia, Mexico, and sundry Australasian mining countries, but are in no way distinctive, nor do they possess any special claim for description.

It is a noteworthy fact that, in the whole exhibition, modern wet methods of gold extraction are, with the exception of the Newberry Vautin process, completely unrepresented, thus markedly diminishing its interest and importance. It is also significant that the attendance has been poor, and, in consequence, the closing of the exhibition is imminent. The key to this enigma is to be found in the distance of the Crystal Palace from the haunts of busy people, and the natural distaste for rational enjoyment of the idlers, which factors are permanent and unavoidable in any case, but disastrous in this.

THE RAILWAY AND CANAL TRAFFIC ACT.

BOARD OF TRADE CLASSIFICATION OF GOODS.

THE powers of railway companies, says the *Manchester Examiner*, originally limited as a set-off to the great privileges granted to them, are about to be radically and completely changed; and the classification is an important factor in that change, being the basis on which the new powers of charging rates will rest.

When the Act of 1888 became law the railway companies were invited by the Board of Trade, under its provisions, to submit their proposals for a new set of maximum rates and charges, and a new classification, which should be considered a basis for the new legislation: They did so, but the classification (with which only we are dealing at present) was very meagre as compared with that in actual use. At the long inquiry which ensued many witnesses and representatives were heard on the special question of the classification of different goods in which they were interested, and, had time allowed, hundreds more were ready and could have been heard. But time did not allow. The result of all this is that the Board of Trade (acting under section 24 of the Act) have framed a new classification, which in default of alteration before a Parliamentary Committee (before which their bill is pretty sure to come) will become law all over the country, taking the place of, and entirely cancelling, the old powers under the hundreds of special and general Acts.

The list shows, we believe, subject to explanations to follow, all the changes in classification which would take place were the Board of Trade schedule to become law. That schedule is compared here with the present Railway Clearing House classification, which is not a Parliamentary one, but has been formed by the railway companies for their own convenience in making and dividing charges. It is the practical result of their experience in dealing with traffic since the formation of railways. The Clearing House book contains a great many more articles than the Board of Trade schedule, and also much more minute and specific descriptions of them and of the various modes of packing, and other matters affecting the classification. This is one source of difficulty in making a true comparison; another is the constant use in the Board of Trade schedule of the letters "e. o. h. p." (except otherwise herein provided). This not only makes it necessary to look in every other class to see whether, or how, the article is otherwise provided, but in some cases evidently refers to provisions affecting the article which are not found under the same name.

The following list does not include all the changes which are, or might be, the effect of the non-insertion in the Board of Trade schedules of an immense number of names and descriptions of articles occurring in the present classification. The cases are very few in which an article has simply been transferred from one class to another. Where articles appear in both classifications, and there has been no real change, the articles do not appear in our lists. Again, the words descriptive of the method of packing, limits of quantity, and other particulars in our list will sometimes not be found in the Clearing House list or in that of the Board of Trade. They are rendered necessary to define the net result of the changes. We give examples to show the principles on which our list is made.

1. In class 2 of our list will be found "biscuits, ship and dog," as being transferred from class 1. The fact is that only the word "biscuits" is found in the Board of Trade proposals, and it is in class 2. In the Clearing House book "biscuits, except ship and dog," are in class 2; and "ship and dog" in class 1. There is, therefore, no alteration except for ship and dog biscuits, which it is proposed shall come under class 2, along with all other biscuits; and this change we indicate. In this case, as "biscuits" includes all biscuits, it cannot be said that any sort are unclassified by the Board of Trade.

2. On the other hand, in our list, under class 2, will be found "Cotton, raw, not press-packed bales," as transferred from class 1. In this case only the words "Cotton, raw," are found in the Clearing House list (in class 1). The actual words of the Board of Trade list are "Cotton, raw, e.o.h.p." We find "Cotton, raw, in press-packed bales" in the proposed class 1 (in which class it now is). It, therefore, is the "otherwise herein provided." All other cotton comes into class 2. We, therefore, take no notice of the p.p. bales, which are unchanged, but indicate the change in the other cotton. In this case, again, no cotton can be said to be unprovided for in either list. "Cotton" means all cotton, and "Cotton e.o.h.p." means all cotton except press-packed bales, which are provided for in class 1.

In the following list "e o h p." signifies "except otherwise herein provided;" it refers of course, to the Board of Trade shedules, and not to our list. "Hyd. p.p.," "s.p.p.," "m.p.p." signify respectively hydraulic press packed, steam press packed, machine pressed packed. "X.," "y," or "z" appended to the number of a class refer to articles which are now carried at a reduction from the ordinary class rates when at owners' risk, thus practically forming different classes; they are indicated by these letters in the present Clearing House book. No similar provision is made in the Board of Trade schedule. "O.r." at owner's risk. We have not noticed the addition of the words "or steel" to the description of many iron articles, as they would cause no practical alteration; nor have we taken account of many slight alterations of phraseology and description. The following lists include merely the articles of interest to the chemical trade.

THE PROPOSED CLASS A

(the lowest) corresponds with class MA, the lowest in the present Clearing House classification. As the number of articles in it are few, we set them all out. The proposed class contains the following articles, which are at present in class MA: Cannel, coal cinders, coal, coke, culm, ganister, iron ore, ironstone, slack, blast furnace slag or scoria, and also the following articles which are now in the Clearing House, Class M.B. (second lowest). Basic slag, (unground), chalk in the rough for manufacturing purposes, clay in bulk, coprolite and rock phosphate (unground), creosote, coal tar, gas tar, and gas water, in owners' tank waggons; gas lime, or gas purifying refuse; gravel, hammer scale, iron pyrites, unburnt and burnt; limestone, in bulk; manure, street, stable, farmyard, in bulk; nightsoil, in owners' wagons; purple ore, sand, stone, stone in the rough, tap or mill cinder, and waste sulphate of lime.

PROPOSED CLASS B.

In this and all the following classes the articles which are contained in each proposed class, and also in the corresponding class of the present Clearing House classification, are too numerous to be here set out. Those which are contained in the Clearing House book, but are *not* contained in any of the proposed classes, are still more numerous. Subject to these latter articles remaining unclassified, we deal with *changes* of classification only. The new class B contains the following articles, which are now in class S of the Railway Clearing House book (which corresponds to class C of the proposals). They would, therefore, be lowered one class:—

Basic slag, ground, packed; blooms, billets, or ingots, iron or steel (foreign); China clay in bulk; copperas, green, in bulk; coprolites and rock phosphate (ground); draff, or brewers' or distillers' grains; ferro-manganese, in bulk; gypsum, for manure; iron and steel, un-

damageable; clippings, shearings, and stampings of sheet iron and tin plates, in compressed bundles; granulated iron; kainit, in bags; manganese ore; manure (other than street, stable, or farmyard in bulk); spiegeleisen, in bulk; sulphate of potash; sulphur ore (some); zinc ashes; lead ashes, in bulk; lias lime, in bulk.

The following articles now in the classes appended in brackets are to be found in the proposed class B. China grass, less than 2½ tons (1); cutch (1); divi divi (1); esparto grass, hyd. or s.p.p., under 2½ tons (1); flax, straw, hyd. or s.p.p. (new—"flax straw" is now 3Y, flax waste, for paper making, hyd. or s.p.p.); brewers' and distillers' grains or draff (see B); ditto, desiccated; rice flour; sago flour; tapioca flour; scrap iron, light; linen waste for paper making, hyd. or s.p.p. (1); Mexican fibre, hyd. or s.p.p. (1); old sails for paper making (1); slag, refuse from glass works (MA); sulphate of copper for export, ten ton lots (1); tow waste for paper making, hyd. or s.p.p. (1); valonia (1); zinc, carbonate of (1).

THE PROPOSED CLASS 1.

The following articles would be brought into this class under the Board of Trade proposals. They are now in the classes appended in brackets. All the numbered classes correspond to the present classes of the same numbers:—

Algerian fibre, machine pressed, 2½ tons (S); bagging, old in bundles, for paper making (S); candles, stearine (2); copperas (green not in bulk) (S); esparto grass, machine pressed, see C (S); fleshings and glue pieces, wet from tanners, not packed (S—o.r.); oils, not dangerous, in casks or iron drums, round or tapered at one end (new spec.); cod liver, sperm (2); lubricating mineral—shale, crude—now subject to regulations for dangerous goods; pelts, wet, from tanners, not packed, o.r. (S); salammoniac (2); shot, lead in bags, packed in cases (now casks); spetches, wet, from tanners, not packed, o.r. (S); strawboard cuttings for paper making (S); sugar mats, old, for paper making (S); Surat bagging for paper making (new); tarpaulins, old, for paper making (S); tow, now 2; tow for paper making (1).

THE PROPOSED CLASS 2.

The following articles would be brought into this class under the Board of Trade proposals. They are now in the classes appended in brackets:—

Algerian fibre, not press packed (3Y); ditto p.p., under 2½ tons (1); antimony regulus (1); asbestos, ground (1); ditto crude (s); bagging, e.o.h.p. (Surat 1) (old in bundles, not p.p., S); bags, paper (1); bark for tanning, e o.h.p., not chopped, packed (1); biscuits, ship and dog (1); bottle stoppers, wood, packed (1); bottles, earthenware or stoneware, if not protected (1, o.r.); carbolic seed-dressing, in casks or iron drums (1); china grass, under 20 cwt. (3Y); cotton, raw, not press packed bales (1); dextrine, in hampers (3); ditto, in bags (1); esparto grass, under 20 cwt. (3Y); iron liquor or muriate of iron, in casks or iron drums (1); jars, earthenware, or stoneware, packed (1), not packed (o.r., 1); lead piping, e.o.h.p. (2Y); linen, grey (new); nitrate of iron, not in casks (dangerous); paraffin and petroleum oils, in owner's tank wagons (new) (in casks or iron drums, now 2); pumps and pump casting, in cases (1); silicate cotton or slag wool, otherwise than in casks or bags (new); tin, liquor, in carboys or tubs (4); brass or copper, old (1).

PROPOSED CLASS 3.

The following articles would be brought into this class under the Board of Trade proposals. They are now in the classes appended in brackets:—

Algerian fibre, e.o.h.p. (3Y); arsenic acid (e.o.h.p. new); boracic acid, crude, in casks (2); bottles and bottle stoppers, glass, e.o.h.p. not packed (1); chemicals, not dangerous, corrosive, or explosive, in casks, iron drums, bales, or bags (new) (this might include an immense number of articles now separately specified); china grass, e.o.h.p. (3Y); crucibles, e.o.h.p. (3Y); electric batteries, storage (2); electric cable, telegraph cable, and electric lighting cable (4Y); esparto grass, e.o.h.p. (3Y); glycerine grease (2); gums, otherwise than in mats or bags (2); oils, not dangerous, e.o.h.p. (new), would bring into class 3 mustard in bottles or boxes, and neatsfoot in tins in cases; whale, in tins, packed in boxes (2); olive, in tins, not otherwise packed, and other oils, in cans, jars, and bottles packed in casks or boxes (4); pans, chemical, iron or steel (2); paper, e.o.h.p. (now classed according to nature of packages; proposed to be classed according to purpose; makes exact statement of changes in class impossible); paper hangings e.o.h.p., except com. in bales (2); turpentine, spirits of, in casks or iron drums (2); vaseline, in casks (2); (Any articles not otherwise provided for are proposed to be chargeable with class 3 rates until added to the schedule, pursuant to the provisions of the Act.)

PROPOSED CLASS 4.

The following articles would be brought into this class under the Board of Trade proposals. They are now in the classes appended in brackets;—

Anthracene, other than crude, in casks (5); carbolic acid, solid, for disinfecting (1); chemicals, not dangerous, corrosive, or explosive, in boxes or hampers (new); citric acid, in casks or cases (3); dye extracts, in boxes, casks, or iron drums (3); dyes, in copper carboys (3); glasshouse pots (4Z); glass, prepared, for photographers (4Y); gutta percha goods (3); oleic acid, other than in casks or iron drums (new); pans, copper (3); tartaric acid, in casks or cases (3).

PROPOSED CLASS 5.

The following articles would be brought into this class under the Board of Trade proposals. They are now in the classes appended in brackets:—

Ammonia liquid, in bottles in cases without lids (4); carboys, glass, if not protected, o.r., (3); chemicals, not dangerous, corrosive, or explosive, e.o.h.p., otherwise than in boxes or hampers (new); colours in jars under two gallons (4); dyes, in glass carboys (5Y); glycerine, in crates, hampers, bktd. tins, and jars under two gallons (4); isinglass (4); turpentine, manufactured, packed (5Y); spirits, in jars in cases, and jars or bottles under two gallons (4); turpentine, spirits of, in cases, jars, boxes, or bktd. tins (4); yolk of eggs, in casks, or jars, or bottles in cases (4).

THE NEW AMERICAN TARIFF.

The following is an abstract of the provisions of the New American Tariff, so far as they bear directly or indirectly on the Chemical Trade.

DUTIABLE LIST.

SCHEDULE A.

CHEMICALS, OILS AND PAINTS, ACIDS.

	Old Rate.	*New Rate.*
Acetic or pyroligneous—		
Not exceeding specific gravity of 1·047 ..	2 c.	1½ c.
Exceeding specific gravity of 1·047 ..	10 c.	4 c.
Boracic	5 c.	5 c.
Chromic	15 p. c.	6 c.
Citric	10 c.	10 c.
Sulphuric or oil of vitriol	Free.	¼ c.
Tannic or tannin	1·00 dols.	75 c.
Tartaric	10 c.	10 c.

ALCOHOLS AND ALKALIES.

Alcoholic perfumery—		
Including cologne and toilet waters, per gallon	2 dols. & 50 p.c.	2 dols. & 50 p.c.
Alcoholic compounds not specially provided for, per gallon	2 dols. & 25 p.c.	2 dols. & 25 p.c.
Alumina, alum, alum cake, patent alum, sulphate of alumina and aluminous cake and alum in crystals or ground	6-10 c.	6-10 c.
Ammonia—Carbonate	20 p.c.	1¼ c.
Muriate or salammoniac	10 p.c.	¼ c.
Sulphate	20 p. c.	½ c.
Blacking of all kinds	25 p.c.	25 p.c.
Blue vitriol or sulphate of copper	3 c.	2 c.
Bone charcoal for decolourizing sugars ..	25 p.c.	25 p.c.
Borax—Crude or borate of soda or borate of lime	3 c.	3 c.
Refined borax	5 c.	5 c.
Camphor, refined	5 c.	4 c.
Chalk—Prepared, precipitated, French and red	20 p. c.	1 c.
All other chalk preparations	20 p.c.	20 p. c.
Chloroform	50 c.	25 c.

COAL TAR PREPARATIONS.

All coal tar colours or dyes	35 p. c.	35 p.c.
All preparations of coal tar, not colours or dyes	20 p.c.	20 p.c.
Cobalt oxide	20 p.c.	30 c.
Collodion, and all compounds of pyroxyline ..	50 c.	50 c.
Rolled or in sheets, but not made up into articles	60 c.	60 c.
If in finished or partly finished articles	60 c. & 25 p.c.	60 c. & 25 p.c.
Colouring for brandy, wine, beer, or other liquors	50 p.c.	50 p.c.
Copperas or sulphate of iron	3-10 c.	3-10 c.
Drugs, refined, ground, or manufactured ..	10 p.c.	10 p.c.
Ethers—Sulphuric	50 c.	40 c.
Spirits of nitrous ether	30 c.	25 c.
Fruit ethers, oils or essences	2·50 dols.	2·50 dols.
Ethers not specially provided for	1 dol.	1 dol.

	Old Rate.	New Rate.
Extracts and decoctions of logwood and other dye woods, sumac and other barks, for dyeing or tanning	10 p.c.	⅞ c.
Of hemlock	10 p.c.	½ c.
Gelatine, valued not above 7 c. per lb.	30 p.c.	1½ c.
Above 7 c. and not above 30 c.	30 p.c.	25 p.c.
Above 30 c.	30 p.c.	30 p.c.
Glue, valued not above 7 c. per lb.	20 p.c.	1½ c.
Above 7 c. and not above 30 c.	20 p.c.	25 p.c.
Above 30 c.	20 p.c.	30 p.c.
Isinglass or fish glue, valued not above 7 c. per lb.	25 p.c.	1½ c.
Above 7 c. and not above 30 c.	25 p.c.	25 p.c.
Above 30 c.	25 p.c.	30 p.c.
Glycerine, crude, not purified	2 c.	1¾ c.
Refined	5 c.	4½ c.
Indigo, extracts or pastes of	10 p.c.	¾ c.
Carmined	10 p.c.	10 p.c.
Ink and ink powders, printers' ink	30 p.c.	30 p.c.
Iodine, resublimed	40 c.	30 c.
Iodoform	2 dols.	1·50 dols.
Liquorice extracts	7½ c.	5½ c.
Magnesia, carbonate, medicinal	5 c.	4 c.
Calcined	10 c.	8 c.
Sulphate, or Epsom salts	1½ c.	3·10 c.
Morphia or morphine, and all salts thereof	1 dol.	50 c.

OILS.

Alizarine assistant, or soluble oil or oleate of soda or Turkey red oil, containing more than 50 p.c. of castor oil, per gallon	25 p.c.	80 c.
All other	25 p.c.	30 p c.
Castor oil, per gallon	80 c.	80 c.
Cod liver oil, per gallon	25 c.	15 c.
Cottonseed oil, per gallon of 7½ lbs. weight	25 c.	10 c.
Croton oil, per pound	50 c.	30 c.
Flaxseed, or linseed and poppyseed oil, raw, boiled or oxidised, per gallon of 7½ lbs. weight	25 c.	32 c.
Fusel oil, or amylic alcohol	10 p.c.	10 p.c.
Hempseed oil and rapeseed oil, per gallon	10 c.	10 c.
Olive oil for salad purposes, per gallon	25 p.c.	35 p.c.
Peppermint oil	25 p.c.	80 c.
Seal, herring, whale, and other fish oil, per gallon	25 p.c.	8 c.
Opium, laudanum, liquid preparations	40 p.c.	40 p.c.
Opium containing less than 9 per cent. of morphia, and opium prepared for smoking, per lb.	10 dols.	12 dols.

PAINTS, COLOURS AND VARNISHES.

Baryta, sulphate, or barytes, unmanufactured, per ton	10 p.c.	1·12 dols.
Manufactured	¼ c.	6·72 dols. (ton)
Blues, such as Berlin, Prussian, Chinese, containing ferro-cyanide or iron	20 p.c.	6 c.
Blanc-fixe, or satin white, or artificial sulphate of barytes	25 p.c.	¼ c.
Black—Bone, ivory or vegetable, lampblack	25 p.c.	25 p.c.
Chrome yellow, green, and all other chromium colours in which lead and bichromate of potash or soda are component parts	25 p. c.	4½ c.
Ochre and ochrey earths, sienna, umber, dry	½ c.	¼ c.
Ground in oil	1½ c.	1½ c.
Ultramarine, blue	5c.	4½ c.
Varnishes, gold size or japan	Free	35 p c.
Other varnishes	40 p.c.	35 p c.
In addition, on spirit varnishes for the alcohol contained therein, per gallon	40 p.c.	1·32 dols.
Vermilion red and colours containing quicksilver	25 p.c.	12 c.
Wash blue, containing ultramarine	25 p c.	3 c.
Whiting and Paris white, dry	½ c.	½ c.
Ground in oil or putty	1 c.	1 c.
Zinc, oxide, dry	1¼ c.	1¼ c.
Ground in oil	1¾ c.	1¾ c.
Artists' water colours	30 p c.	30 p.c.
All other paints and colours, crayons (now 20 p.c.), lakes, frostings, artists' colours of all kinds	25 p.c.	25 p.c.

	Old Rate.	New Rate
LEAD PRODUCTS.		
Acetate, white	6 c.	5½ c.
Brown	4 c.	3½ c.
Litharge	3 c.	3 c.
Nitrate	3 c.	3 c.
Orange mineral	3 c.	3½ c.
Red lead	3 c.	3 c.
White lead and white paint containing lead	3 c.	3 c.
Phosphorus	10 c.	20 c.
POTASH.		
Bichromate and chromate	3 c.	3 c.
Caustic or hydrate, refined in sticks or rolls	20 p.c.	1 p.c.
Hydriodate, iodide and iodate	50 c.	50 c.
Nitrate, saltpetre, refined	1½ c.	1 c.
Prussiate, red	10 c.	10 c.
Yellow	5 c.	5 c.
PREPARATIONS.		
Medicinal preparations of which alcohol is a component or in preparing which alcohol is used	50 c.	50 c.
Of which alcohol is not a component	25 p.c.	25 p.c.
Proprietary preparations of which alcohol is not a component	50 p.c.	25 p.c.
Calomel and other mercurial preparations	20 p.c.	35 p.c.
Alkalies, distilled, essential, and expressed oils and all chemicals not specially provided for	25 p.c.	25 p.c.
Toilet preparations for hair, mouth, teeth, or skin	50 p.c.	50 p.c.
Santonine and salts, containing 80 p.c. of	3 dols.	2·50 dols.
Soap—castile	20 p.c.	1¼ c.
Fancy, perfumed, and toilet	15 c.	15 c.
All others	20 p.c.	20 p.c.
SODA.		
Bicarbonate, supercarbonate, saleratus	1½ c.	1 c.
Hydrate or caustic soda	1½ c.	1 c.
Bichromate and chromate	3 c.	3 c.
Sal soda and soda ash	¼ c.	¼ c.
Silicate of soda	½ c.	½ c.
Sulphate, salt cake, nitrate cake	20 p.c.	1·25 dols. (ton)
Sponges	20 p.c.	20 p.c.
Strychnia and all salts thereof, per ounce	50 c.	40 c.
Sulphur, refined, rolls, per ton	10 dols.	8 dols.
Sublimed flowers of, per ton	20 dols.	10 dols.
Sumac, ground	3·10 c.	4·10 c.
Tartar, cream of	6 c.	6 c.
Tartars and less crystals	4 c.	4 c.
Tartarate of soda and potassa	3 c.	3 c.

SCHEDULE B.

EARTH'S, EARTHENWARE, AND GLASSWARE, BRICK AND TILE.

	Old Rate.	New Rate.
Firebrick, plain, per ton	20 p.c.	1·25 dols.
Glazed, enamelled, or decorated	45 p.c.	45 p.c.
Tiles and brick, plain	20 p.c.	25 p.c.
Ornamented	60 p.c.	45 p.c.
Encaustic	35 p.c.	45 p.c.
CEMENT, LIME, AND PLASTER.		
Roman, Portland, hydraulic, in packages, including weight of package, per 100 lbs.	20 p.c.	8 c.
In bulk	20 p.c.	7 c.
Other cement	20 p.c.	20 p.c.
Lime, per 100 lbs., including weight of package	10 p c.	6c.
Plaster of Paris, or gypsum, ground, per ton	20 p c.	1·00 dols.
Calcined, per ton	20 p.c.	1·75 dols.
Clays or earths, unmanufactured, per ton	1·50 dols.	1·50 dols.
Wrought or manufactured, per ton	3 00 dols.	3·00 dols.
China clay or kaolin, per ton	3·00 dols.	3·00 dols.
EARTHENWARE AND CHINA.		
Earthenware, stoneware, crucibles, plain	25 p.c.	25 p.c.
Gas retorts, each	25 p.c.	3·00 dols.
GLASS AND GLASSWARE.		
Bottles, common, 1 pint or over	1 c.	1 c.
Less than 1 pint	1 c.	1½ c.
If filled, in addition to duty on contents	30 p.c.	40 p.c.

	Old Rate	New Rate.
Flint, pressed, not decorated	45 p.c.	60 p.c.
Decorated	45 p.c.	60 p.c.
Chemical glassware	45 p.c.	45 p.c.
Blown glassware	45 p.c.	60 p.c.
Porcelain or opal	45 p c.	60 p.c.
Unpolished cylinder, crown and widow glass not 10 × 15 inches square	1⅜ c.	1⅜ c.
Not exceeding 16 × 24	1⅞ c.	1⅞ c.
Not exceeding 24 × 30	2⅜ c.	2⅜ c.
All above	2⅞ c.	3⅛ c.
Cylinder and crown 10 × 15 to 16 × 24, per square foot	2½ c.	4 c.
Do., not exceeding 24 × 30, per square foot	6 c.	6 c.
Do., not exceeding 24 × 60, per square foot	20 c.	20 c.
Do., above that	40 c.	40 c.
Fluted, rolled or rough plate glass, not exceeding 10 × 15 inches, per square foot	¾ c.	¾ c.
Not exceeding 16 × 24, per square foot	1 c.	1 c.
Not exceeding 24 × 30, per square foot	1½ c.	1½ c.
All above	2 c.	2 c.
Plate glass, ground or smoothed, in addition to above	10 p.c.	10 p.c.
Cast, polished, plate glass, unsilvered, not exceeding 10 × 15 inches square, per square foot.	3 c.	3 c.
Not exceeding 16 × 24, per square foot	5 c.	5 c.
Not exceeding 24 × 30, per square foot	8 c.	8 c.
Not exceeding 14 × 60, per square foot	25 c.	25 c.
All above	50 c.	50 c.

(To be continued.)

Official Memoranda.

(From the Board of Trade Journal.)

NEW CUSTOMS TARIFF OF CANADA.

THE following is a statement of the rates of import duty now levied upon Chemical Products under the new Customs Tariff of Canada:—

Articles.	Duties levied.	
		Dols. Cts.
Tallow	Lb.	0·01
Paraffin wax, stearic acid and stearine of all kinds	,,	0·03
Candles, tallow	,,	0·02
Do., parffin wax	,,	0.05
Do., all other, including sperm	25% *ad val.*	
Soap, common brown and yellow, not perfumed	Lb.	0·01½
Do., perfumed or toilet, the weight of the inside packages and wrappers to be included in the weight for duty	,, and 10% *ad val.*	0·10
Castile soap, mottled or white, and white soap.	Lb.	0.02
Soap powders, pumice, silver, and mineral soaps, sapolio, and other like articles, the weight of the package to be included in the weight for duty	,,	0·03
British gum, dressing, sizing cream, and enamel sizing	,,	0·01
Glue, sheet, broken sheet, and ground	,,	0·03
Mucilage and liquid glue	30% *ad val.*	
Extract of malt (non-alcoholic) for medicinal purposes	25% *ad val.*	
Starch, including farina, corn, starch, or flour, and all preparations having the qualities of starch, not sweetened or flavoured	Lb.	0·02
When sweetened or flavoured the weight of the package to be in all cases included in the weight for duty	,,	0·04
Saccharin, or any product containing over one-half of 1 per cent. thereof	,,	10·00
Opium (crude), the weight to include the weight of the ball or covering	,,	1·00
Ale, beer, and porter, when imported in casks, or otherwise than in bottles	Imp. gall.	0·10

Articles.	Duties levied.	
		Dols. Cts.
Do., do., do., when imported in bottles (6 quarts or 12 pint bottles to be held to contain one Imperial gallon)	Gall.	0·18
Cider, not clarified or refined	,,	0·05
Do., clarified or refined	,,	0·10
Lime juice, fortified with or containing not more than 25 per cent. of proof spirit	,,	0·60
And when containing more than 25 per cent. of proof spirit	,,	2·00
Lime juice, sweetened, and fruit syrups, not otherwise provided for	,,	0·40
Lime juice and other fruit juices not otherwise provided for, not alcoholic and not sweetened	,,	0·10
Spirituous or alcoholic liquors distilled from any material, or containing or compounded from or with distilled spirits of any kind and any mixture thereof with water, for every gallon thereof of the strength of proof, and when of a greater strength than that of proof at the same rate on the increased quantity that there would be if the liquors were reduced to the strength of proof. When the liquors are of a less strength than that of proof the duty shall be at the rate herein provided, but computed on a reduced quantity of the liquors in proportion to the lesser degree of strength; provided, however, that no reduction in quantity shall be computed or made on any liquors below the strength of 15 per cent. under proof, but all such liquors shall be computed as of the strength of 15 per cent. under proof, as follows:—		
(*a*) Ethyl alcohol or the substance commonly known as alcohol, hydrated oxide of ethyl, or spirits of wine, gin of all kinds, not elsewhere specified, rum, whiskey, and all spirituous or alcoholic liquors, not otherwise provided for	,,	2·00
(*b*) Amyl alcohol or fusel oil, or any substance known as potato spirit or potato oil	,,	2·00
(*c*) Methyl alcohol, wood alcohol, wood naphtha, pyroxylic spirit, or any substance known as wood, spirit, or methylated spirit; absinthe, arrack, or palm spirit; brandy, including artificial brandy and imitations of brandy; cordials and liqueurs of all kinds not elsewhere specified; mescal, pulque, rum shrub, schiedam, and other schnapps; tafia, angostura, and similar alcoholic bitters or beverages	,,	2·00
(*d*) Spirits and strong waters of any kind mixed with any ingredient or ingredients, and being or known or designated as anodynes, elixirs, essences, extracts, lotions, tinctures, or medicines not elsewhere specified	,, and 30% *ad val.*	2·00
(*e*) Alcoholic perfumes and perfumed spirits bay rum, cologne, and lavender waters, hair, tooth, and skin washes and other toilet preparations containing spirits of any kind, when in bottles or flasks, weighing not more than 4 ounces each	50% *ad val.*	
When in bottles or flasks or other packages weighing more than 4 ounces	,, and 40% *ad val.*	2·00
(*f*) Nitrous ether, sweet spirits of nitre, and aromatic spirits of ammonia	,, and 30% *ad val.*	2·00
(*g*) Vermouth and ginger wine, containing not more than 40 per cent. of proof spirits	,,	0.75
If containing more than 40 per cent. of proof spirits	,,	2·00
(*h*) In all cases where the strength of any of the foregoing articles cannot be correctly ascertained by the direct application of the hydrometer, it shall be ascertained by distillation of a sample, or		

Articles.	Duties levied.
	Dols. Cts.
in such other manner as the Minister of Customs directs.	
Proprietary medicines, to wit, all tinctures pills, powders, troches or lozenges, syrups, cordials, bitters, anodynes, tonics, plasters, liniments, salves, ointments, pastes, drops, waters, essences, oils, or medicinal preparations or compositions recommended to the public under any general name or title as specifics for any diseases or affections whatsoever affecting the human or animal bodies, not otherwise provided for; all liquids 50 per cent. *ad val.*, and all others 25 per cent. *ad val.*	50% *ad val.* and 25% *ad val.*
Sulphuric ether	Lb. 0·05
Acid, acetic and pyroligneous, not elsewhere specified, and vinegar, a specific duty of 15 cents for each gallon of any strength not exceeding the strength of proof, and for each degree of strength in excess of the strength of proof an additional duty of 1 cent. The strength of proof shall be held to be equal to 6 per cent. of absolute acid, and in all cases the strength shall be determined in such a manner as is established by the Governor in Council ..	Gal. 0·15 and 0·01 additional.
Acid, acetic and pyroligneous, of any strength, when imported by dyers, calico printers, or manufacturers of acetates or colours for exclusive use in dyeing or printing, or for the manufacture of such acetates or colours in their own factories, under such regulations as are established by the Governor in Council	,, 0·25 and 20% *ad val.*
Acid, muriatic and nitric	20% *ad val.*
Acid, sulphuric	Lb. 0·00½
Acid, sulphuric and nitric combined, and all mixed acids	25% *ad val.*
Acid phosphate	Lb. 0·03
Liquorice paste	,, 0·02
Liquorice, in rolls or sticks	,, 0·03
Red and yellow prussiate of potash	10% *ad val.*
Aniline dyes not otherwise provided for ..	10% *ad val.*
Blacking, shoe and shoemakers' ink, and shoe, harness, and leather dressing, and harness soap	30% *ad val.*
Blueing, laundry blueing of all kinds	30% *ad val.*
Lamp black, and ivory black	10% *ad val.*
Lead nitrate and acetate of, not ground ..	5% *ad val.*
Dry white and red lead, orange mineral, and zinc white	5% *ad val.*
Colours, dry, not elsewhere specified	20% *ad val.*
Oxides, ochres, and ochrey earths, fireproofs, umbers, and siennas, ground or unground, washed or unwashed, calcined or raw ..	30% *ad val.*
Paints and colours, pulped or ground in oil or other liquids, and all liquid prepared or ready mixed paints not elsewhere specified..	30% *ad val.*
Paints, ground or mixed in or with either japan, varnish, lacquers, liquid driers, collodion, oil finish or oil varnish, rough stuff and fillers, the weight of the package to be included in the weight for duty ..	Lb. 0·55 and 25% *ad val.*
Paints and colours, ground in spirits, and all spirit varnishes and lacquers	Gall. 1·00
Paris green, dry	10% *ad val.*
Turpentine, spirits of	25% *ad val.*
Varnishes, lacquers, japans, japan driers, liquid driers, collodion, and oil finish not elsewhere specified..	Gall. 0·20 and 25% *ad val.*
Carbolic or heavy oil, for any use	10% *ad val.*
Cod liver oil, medicated..	20% *ad val.*
Essential oils for manufacturing purposes ..	20% *ad val.*
Pomades, French or flower odours preserved in fat or oil for the purpose of conserving the odours of flowers which do not bear the heat of distillation, when imported in tins of not less than 10 lbs. each	15% *ad val.*
Perfumery, including toilet preparations (non-alcoholic), viz.:—Hair oils, tooth and other powders and washes, pomatums, pastes, and all other perfumed preparations not otherwise provided for, used for the hair, mouth, or skin	30% *ad val.*
Illuminating oils composed wholly or in part of the products of petroleum, coal, shale, or lignite, costing more than 30 cents per gallon	25% *ad val.*
Oils, coal, and kerosene distilled, purified, or refined; naphtha, benzole, and petroleum; products of petroleum, coal, shale, and lignite, not elsewhere specified	Imp. gall. 0·07⅕
Lubricating oils, composed wholly or in part of petroleum, and costing less than 30 cents per gallon	,, 0·07⅕
All other lubricating oils..	25% *ad val.*
Lard oil	20% *ad val.*
Linseed or flax-seed oil, raw or boiled.. ..	Lb. 0·01¼
Neatsfoot oil	20% *ad val.*
Olive or salad oil	20% *ad val.*
Sesame seed oil	20% *ad val.*
Vaseline, and all similar preparations of petroleum for toilet, medicinal, or other purposes, in bulk	Lb. 0·04
In bottles or other packages not over 1 lb. in weight in each	,, 0·06
Axle grease	,, 0.01

(To be continued.)

Our Book Shelf.

GENERAL ORGANIC CHEMISTRY. By Prof. E. Hjelt. Translated by J. Bishop Tingle, Ph. D., F.C.S., pp. 220, price six shillings. London: Longmans, Green, and Co., 1890.

The English language is exceedingly deficient in works of novelty bearing upon the subject of organic chemistry. The few available are moreover written in such a style as to discourage even the most painstaking student, as the generalisation can only be systematised by him after the most laborious application.

The work before us will be of the utmost value to students of organic chemistry. The system of its arrangement is good, and though it may be styled a theoretical handbook, yet it is sufficiently practical to give many a hint to the student in research.

We have in our minds' eye a certain student who had been studying organic chemistry at one of our leading universities for nearly three years, and who thought he had not acquired that amount of information, which should weigh down the fees charged by his *Alma Mater*, asking his professor where he could get some information relative to the practical accomplishment of many of those organic mutations now so common in industrial processes. The canny professor's reply was stated to be—"Ah! you must come to me privately for that." This may explain why descriptions of operations for radicle substitutions in organic bodies are not so common as they might be in England, and it is with pleasure that we notice the chapters on oxidation, reduction, dehydration, hydration, splitting off of halogen hydrides amongst others in the work before us.

Mr. Tingle is to be congratulated upon the style and accuracy of the translation. To the interested student the book will read as easily and as pleasantly as a novel.

ANOTHER MORDANT.—As a new mordant, M. Chevallot purposes to use the resinates of alumina and zinc, the first for basic colours, the second for acid colours. These he produces direct on the tissue by first impregnating it with a 1 per cent. solution of resin in caustic potash; then immersing the tissue in a solution of acetate of alumina or sulphate of zinc. By double decomposition, resinate of alumina or of zinc, as the case may be, is formed on the tissue, which is then ready to be dyed. We are not very favourably impressed with the use of resin for this purpose; we think that there are several objections which could be urged against it; one is that the tissue is liable to have a tacky feel, resinates being rather greasy bodies. Chevallot speaks of the resinate of alumina as giving water-resisting properties to the tissue; this has long been known, but is not used in practice, as there are several defects, some serious, which prevent its use for this purpose.

NOTICE.

WE have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

October 7th.—"Manufacturing Smoke."
November 4th.—"Domestic Smoke."
December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the first lecture—"Manufacturing Smoke"—the chair was taken by Alfred E. Fletcher, Esq., Her Majesty's Chief Inspector of Alkali, &c., Works; and models of various appliances were exhibited.

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

Correspondence.

ANSWERS TO CORRESPONDENTS.

P K.—Have nothing to do with it.

H. D. P.—The stain is due to iron.

F. C. S.—We have heard of the movement already.

Cardiff.—The West Riding of Yorkshire is the principal seat of manufacture.

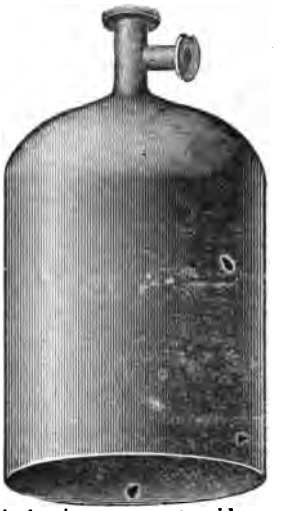
H. M. (Belfast).—The mineral is said to have been produced by decomposition of trap or basalt.

*** *We do not hold ourselves responsible for the opinions expressed by our correspondents.*

COVERING STEAM PIPES AND WOOD DISTILLING.

(To the Editor of the Chemical Trade Journal.)

Sir,—In answer to your correspondent's enquiry respecting covering steam pipes and wood distilling, there are many most excellent makers of non-conducting compositions in the market, whose names and addresses may be found in the Directory. From experience I can speak well of that supplied by Messrs. F. Leroy and Co., London. Pipes covered with hay or straw bands, then saturate the hay or straw with chloride of calcium liquor, after which bind tightly round with old bagging cut into strips, ends of strips being stitched together to form a long band as required. The bagging should be well tarred over two or three times after it is bound around the hay or straw. This makes a cheap and effective covering. Coming to the lament as to the products of wood "staving" fetching such unremunerative prices, so that the British manufacturer is outdone by foreign makers, it should be remembered that most of the works in this country were started for the sake of the charcoal, enormous quantities of which were required for tin plate works—now coke is principally employed for this purpose—hence the chief product from the distillation of wood is now practically worthless. Acetate of lime and naphtha, the two other commodities obtained in the operation, are now the mainstay of the works. On the Continents of Europe and America charcoal realises good prices for domestic use, etc., instead of coal, so that the acetate of lime costs less and can be sold much under apparent actual costs. Your correspondent should travel and see for himself the different methods of working abroad. The works here are very insignificant compared with the foreigners (except in one or two instances here where the raw material—wood—is supplied as cuttings from an adjacent factory, where big lots of timber are used for making cotton reels, etc., or in the form of saw dust and not actual cuttings from standing trees). He would be astonished at the extraordinary attention to details observed, especially in the French works. I have had the privilege of going over many works, but those in the South of France more particularly astonished me for their magnitude and wonderful organisation. Grey acetate of lime is there made for the most part. They run 100 retorts as large as any in this country, and have besides twelve very large retorts this shape—



Each capable of working over 300 cubic feet of wood at a charge, and taking a week to effect the distillation! Most of the patent retorts I have seen have for their object economy in firing, loading, and discharging, the naphtha and pyroligneous acid must be got off by heat and the question is which is the cheapest method of doing it. British manufacturers in this line do not seem to infuse much enthusiasm into their work, for instance, here is acetate of soda made direct from the pyroligneous acid on the Continent and largely imported into England, also glacial acetic acid and acetone (the latter has lately come into good demand as a solvent for smokeless powder making, etc) are being made direct from grey acetate of lime abroad. Our countrymen could produce these things at their existing works if they would only put their shoulders to the wheel. The trade would much benefit if all jealousies were put aside, a combination made, the several works reorganised, and all the products sold through a central office.

Every year my firm do their best to buy their raw material from British manufacturers, but price prohibits the business with them, and it is with mingled feelings of regret and chagrin that they have to place their contracts with America for some thousand tons of acetate of lime,

I am, Sir, Yours faithfully,

J. E. Johnson Johnson.

F.I.C., F.C.S.

Trade Notes.

To Gum on Tin.—To make labels adhere to tin, use a freshly made solution of gum tragacanth in water.

Dividends.—The Board of Mason and Barry, Limited, announce a dividend of 3s. per share.—A dividend at the rate of 15 per cent. per annum is recommended by the Board of Woodhouse and Rawson United, Limited, adding £25,000. to the reserve fund, and carrying forward £16,335.

Substitute for Iodoform.—A red-brown odourless powder derived from iodine and salicylic acid, which is insoluble in water, alcohol, ether, and oil, changing to a bright-red powder by heating it with mineral acids, and melting at about 225° Centigrade, with decomposition, and being insoluble in alkalies, substantially as described.

Growing Tobacco in England.—The growing of tobacco in England is not given up. Sir Edward Birkbeck has grown a splendid crop of the white barley variety. Last year Sir Edward sold a crop at sixpence per pound. There is a small but beautiful crop to be seen at Lord's Cricket Ground, and the Horticultural College and Produce Company, Swanley, Kent, are conducting experiments, which promise to be successful, on their farms. A large garden of tobacco plants is one of the handsomest sights to be witnessed in the country.

Explosion at Soapworks.—A serious explosion took place on the 16th inst, at the soapworks of Messrs. Jarratt Brothers, Bradford, by which Mr. Jarratt, a member of the firm, and four workmen were dreadfully injured. A "boil" of soap was in course of manufacture, and the explosion occurred at the moment when a quantity of paraffin was being poured in. Great sheets of flame enveloped all the men standing near, and they were fearfully scorched. All were taken to the hospital.

Shoemakers' Cement.—Mr. J. Saunders has obtained a patent for a cement to be used for attaching leather to boots, and for belts. The cement is prepared by mixing together: Methylated ether, 1 lb.; carbon bisulphide, 8 lbs.; raw gutta-percha, 1 oz.; elastic glue, 1 oz.; india-rubber tissue, 1 lb. The mixture is left for twelve hours, and after being agitated for one hour is fit for use. The mode of application is to roughen the surfaces of the articles to be united, to apply one or two coats of the cement, allow to dry, warm gently, press both articles firmly together, and tap with a hammer.

THE SANTA ELENA NITRATE CO., LTD.—The report of the Santa Elena Nitrate Company, Limited, made up to June 30, 1890, states that the accounts show a nett profit of £2,031., which the directors propose to carry forward. Owing to the extensive development work and erection of additional machinery, buildings, &c, carried out during the year, the production of nitrate was necessarily very small, the actual time in operation being only five months, and then on a reduced scale. The sum of £16,409. has been expended on new works, machinery, and development of the property, owing to which the results obtained since the date of the accounts are very satisfactory, and the directors anticipate that the current year's working will show good results, as the officials will now produce on a comparatively large scale.

THE NEW AMERICAN TARIFF.—In order to escape the higher duties imposed by the McKinley Bill, great efforts were made to get dutiable goods shipped from England to the United States before the new tariff came into operation. These efforts infused temporary energy into various manufacturing industries, and also raised the freights of steamers of high speed. A comparison of the exports from Liverpool to New York during the month of September last and of the preceding September shows the extent of this abnormal activity, taking some of the articles most considerably affected by the McKinley tariff. The shipments from Liverpool in September have been as follows:—Chemicals, 1889, 347,852 dols.; 1890, 670,633 dols. Woollens, 1889, 297,751 dols.; 1890, 475,530 dols. Tinplates, 1889, 900,731 dols.; 1890, 1,308,904 dols. Steel, 1889, 34,391 dols.; 1890, 176,451 dols. Paper, 1889, 24,118 dols.; 1890, 37,048 dols.

THE EXPLOSION OF GASES AND GASEOUS MIXTURES.—In the Chemical Section, at the recent meeting of the British Association, Professors Liveing and Dewar presented a paper on some experiments on the explosion of Gases under high pressure. It was found that, with increase of pressure, the luminosity of the flame was steadily raised. When hydrogen was exploded with excess of oxygen, it was ascertained that large quantities of nitrogen peroxide were formed from the nitrogen present as impurity in the oxygen. The water formed contained 3 per cent. of nitric acid. With excess of hydrogen, small quantities of ammonia were formed. It was discovered that, in an atmosphere of carbon dioxide, it was very difficult to maintain the oxy-hydrogen flame, if the pressure exceeded two atmospheres. Experiments were also made with ethylene and cyanogen exploded with oxygen. Dr. G. S. Turpin also read a paper on the ignition of explosive gaseous mixtures. The author had commenced a thorough investigation of the conditions affecting the ignition of explosive mixture of gases, and the paper gave an account of the results obtained in a series of experiments on the temperatures of ignition of various mixtures of bisulphide of carbon vapour with oxygen and other gases. He used a modification of Mallard and Le Châtelier's second method, in which the gases are introduced into a heated and exhausted bulb. The existence of a discontinuity between gradual combustion and ignition proper was found to exist in some cases, while in others there was a perfect gradation from slow combination, attended by a faint glow, to instantaneous combination, attended by a bright flame. The effect of change of pressure on the ignition was carefully examined by Dr. Turpin, and it was found to be of a somewhat complex nature.

Market Reports.

REPORT ON MANURE MATERIAL.

The market throughout the week has been decidedly quiet, with prices in favour of buyers for both phosphatic and nitrogenous material—we do not hear of any important business in either.

Prices for mineral phosphates remain nominally without alteration, but there indications that for Continental descriptions, somewhat easier prices would be accepted for good lines. For cargoes of Bull River Rock the price is still 11d. per unit, c.i.f. to U.K., but for River Rock from other localities, bids of ¼d. less are invited.

No transactions in cargoes of River Plate bones are reported. There are sellers at £5. 10s., and less would have to be taken to induce business. East Indian bone meal is again a shade easier, and £5. 15s. must now be quoted as nearest value, on spot or for shipment. There are sellers of crushed East Indian bones at £5. 10s., for shipment, delivered ex quay Liverpool, but buyers do not respond at the price. Nearest value of common grinding bones is £4 17s. 6d. to £5., ex quay Liverpool. River Plate bone ash remains firm at £5. 7s. 6d. on 70%, nett, Hamburg conditions, delivered U.K. or Continent. On spot, nitrate is without much charge, the value being 8s. 4½d. for ordinary quality, and 8s. 6d. per cwt. for refined. Due cargoes can hardly be valued at over 8s. 6d. per cwt., and it is doubtful whether even 8s. 6d. could be got for ordinary quality, large size. October-November guaranteed shipments are still quoted at about 8s. 10½d. per cwt, but later shipments could be had at 8s. 9d. per cwt.

Dried blood and ground hoofs without alteration in values. No transactions to report. Superphosphates remain as last quoted.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron rather easier; Scotch warrants closed at 50s. 4½d. cash, and 50s. 8d. one month. Middlesbrough, 47s. cash; hematite, 56s. 9d., cash. Copper rather firmer. Chili bars, G.O.B.'s and G.M.B.'s closed at £57. 15s. to £58. 2s. 6d. cash, and £58. 7s. 6d. to £58. 15s. three months. Tin fell £1.: Straits closed at £97. 10s. to £98 cash; Australian, £97. 15s. to £98. cash, and Straits, three months, £96. 10s. to £97. English ingots, £100. to £101. Lead weak; Spanish, £14. 10s.; English, £14. 15s. to £15. Spelter: Silesian, ordinary, £24. 10s. to £24. 12s. 6d. Quicksilver, £10. 10s. first hand; £10. second hand. Copper shares: Rio Tinto, 24 1/16 to 24 5/16; Mason and Barry, 7⅛ to 7⅜; Tharsis, 5¾ to 6; Cape, 4 15/16 to 5 1/16; Namaqua, 2⅞ to 3; Copiapo, 2⅝ to 2⅞; Libiola, 2⅜ to 2⅝; Panulcillo, 1 to 1⅛.

GLASGOW, WEDNESDAY.—Market firm, with a good business. Scotch done at 49s. 11½d., 50s. 3d., 49s. 11½d., and 50s. 8d., cash, also at 50s. 2d. to 50s. 10d., one month; closing buyers at 50s. 7d., cash, sellers ask ½d. more. Middlesbrough done at 47s. cash, closing with buyers at 47s. cash, and 47s. 3d. one month; sellers ask 3d. higher. Hematite done at 56s. 9d., cash, also at 56s. 10d., 16 days; closing buyers at 56s. 9d., cash, and 57s., one month, sellers ask 3d. more.

WOLVERHAMPTON, WEDNESDAY.—On 'Change this afternoon the demand of the Durham miners for a 20 per cent. advance was discussed. Fuel prices, it is said, have to be greatly raised. Meanwhile local trade continues satisfactory, and a good deal of business has been booked as the result of the quarterly meetings. Marked bars remain £8. 10s., and sheets £8. Pigs are 45s.

TAR AND AMMONIA PRODUCTS.

The benzol market remains in much the same position as we reported last week. Sales have been made in 90s. at 4s. 6d., and to-day's value of 50/90s. is 3s. 6d. Most other products remain in *statu quo*. In anthracene business has again been done at 1s. 6d. for 30% A. In B makes there is no change. The pitch market is unaltered.

The sulphate of ammonia market continues firm and prices generally are slightly dearer. At Hull, £11. 11s. 3d. has been paid for immediate shipment, but generally the ideas of buyers, both here and abroad, do not exceed £11. 10s., which price is again quoted at Leith and also at Liverpool. Beckton price is £11. 12s. 6d., and the same may be quoted as value for outside London makes. There is no great quantity offering, and the demand seems to be equal to the present production.

MISCELLANEOUS CHEMICAL MARKET.

The demand for alkali continues brisk, and business both for prompt and forward deliveries has been done in soda ash at 1 1/16 to 1⅜ per deg. f.o.b., Liverpool. There has been considerable demand for soda ash of 58%, and there is nothing obtainable now under 1⅜d. f.o.b. Caustic soda occupies an uncertain position, especially for forward delivery, there being a general expectation of a fall in price from the present high figures. The prices this week are: 74%, £12. 15s.; 70%, £11. 10s. to £11. 12s. 6d.; 60%, £10. 12s. 6d., and cream 60% £10. per ton, all f.o b. Liverpool. Chlorate of potash is firm at 5½d. per lb. Chlorate of soda dearer at 6¾d. per lb. Bleaching powder remains steady at £5 2s. 6d. to £5. 5s. per ton on rails at makers' works. For 1891, £6. to £6. 5s. per ton. Sulphur has been in strong demand and stocks have been much reduced, price £4. 2s. 6d. to £4. 5s. per ton on rails in bulk. Vitriol scarce. Saltcake in bulk still value for 40s. per ton. Sulphate of copper is in firmer position for forward delivery, spot price £19. to £19. 10s. per ton. Lead salts quiet but firm in price. Nitrate of lead at £21. 5s. to £21. 10s. per ton. White acetate of lead £24. 15s. to £25. per ton at usual points of delivery. Brown sugar of lead in small demand and price at a discount. Litharge very firm and advanced to £17. 10s. per ton. Brown acetate of lime remains steady on the spot at £7. 5s. to £7. 10. at usual points of delivery, and £7. c.i.f. ports. Grey acetate of lime unchanged. Acetate of soda scarce and firm at £17. to £18. c.i.f. Acetic acids without change. Carbolic acid crystals show no improvement, and prices are lower with little or no fresh business being done.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There is a decided firmness in the tone of the chemical market this week, and prices of most products have advanced. Bleaching powder is in greater demand, both for present and forward deliveries, and price for prompt is 2s 6d. to 5s. per ton above that of a week ago. Soda crystals are also dearer with upward tendency. 77% caustic is not offering for prompt, but, for November-December delivery, makers have put up the price 5s. per ton. Soda ash and sulphate of soda are practically the same as last reported.

The formation of the Chemical Union being now almost accomplished, chemical manufacturers on Tyneside are preparing for an extensive stocktaking, preparatory to their works being taken over by the new company on the 1st of November. Instructions have also been issued for an entire set of new books to be opened out, to commence from the date of transfer.

For prompt delivery, to-day's prices are as follows:—Bleaching powder, in softwood casks, £5. 7s. 6d. to £5. 10s. per ton; hardwood casks £5. 12s. 6d. to £5. 15s. per ton. Caustic soda, 77%, solid, in drums, £12. 5s. per ton; ground and packed in 3-4 cwt. barrels, £15. 5s. per ton, November-December delivery; soda ash, 48/52%, 1⅜d. per degree less 7½%; soda crystals, 56s. per ton; sulphate of soda, in bulk, 35s. per ton; ground and packed in casks, 45s. per ton; recovered sulphur, £4. 10s. per ton; chlorate of potash, 5½d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

Small coals for manufacturing purposes continue easy. Northumberland steam small, are offering from 6s. 6d. per ton, and Durham small quoted from 6s. 6d. to 7s. 6d. per ton, according to quality.

The Durham miners are again agitating for an increase of wages, and at a meeting of the Miners' Federation Board, held to-day, it was decided to send in an application to the Coal Owners' Association for an advance of 20%.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Caustic soda has not yet given way perceptibly, but still retains the summit level understood to have been touched a week ago, or thereby. The article, however, is generally expected to recede when it next goes on the move, rather than effect any further advance upon the present high position, which is rather an exceptional one. On the whole, the chemicals market here is a strong one, and the tendency for the most part is towards an enhancement of prices, with makers not over willing to fix very far forward, unless on strong inducement. The stagnation characteristic of dealings in sulphate of ammonia, a week ago, quickly wore off, on buyers consenting to pay the £11: 10s. asked, a figure at which several parcels changed hands between Friday, and Saturday. The hiatus in the Scotch iron trade continues, but pig stocks are large, and the pinch will not make itself severely felt for a time. Bleaching powder has been hardening, and for local despatch is now quoted as under. Bichromates are selling rather more freely, at hardly any change on former quotations. In the paraffin section firmness still prevails, except as to burning oil, which, however, meanwhile loses nothing further. Chief prices current are:—Soda crystals, 56s. 6d. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 7½%, Tyne; caustic soda, white, 76°, £13. 5s., 70/72°, £11. 10s., 60/62°, £10. 10s., and cream, 60/62°, £9. 15s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £6. 5s., and 1 cwt. casks, £6. 15s, net Tyne; refined alkali, 48/52°, 1⅜d., less 2½% Tyne; saltcake, 40s.; borax, English refined, £30., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £5. 15s. to £6. less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5½d., less 5% any port; nitrate of soda 8s. 6d. to 8s. 7½d.; sulphate of ammonia, £11. 10s. f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £19, less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb; paraffin wax, 120°, semi-refined, 3⅝d.; paraffin spirit (naphtha,) 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 4,000 bgs.

THE LIVERPOOL MINERAL MARKET.

On the whole our market has maintained the steadiness last reported. Manganese: Arrivals still continue small, and prices are somewhat firmer. Magnesite: Stocks large, and prices practically in buyers' hands. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £11. Bauxite (Irish Hill brand): Demand still continues and prices are strong at—lump, 22s.; seconds, 18s.; thirds, 14s.; ground, 35s. French chalk: There are more arrivals to report this week; the inquiry, however, is good, and prices remain firm, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate easier prices. Sulphate in demand, especially for finest "Angel White." Pumicestone unaltered: ground at £10., and specially selected lump, finest quality £13. Iron ore easier, and more inquiry for Spanish manganiferous; Bilbao and Santander, 9s. to 10s. 6d. f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore steady. Emerystone: Prices remain unaltered, especially for best brands. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal inquired for at better figures. Chrome ore quieter. Antimony ore and metal in demand at full figures. Asbestos in strong demand, especially Canadian rock, which brings full prices. Potter's lead ore of best and "standard" brands in request; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Good qualities in demand at top prices. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, steadier. Plumbago: Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay, more doing—common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), firm, finest quality, 22s.

THE LIVERPOOL COLOUR MARKET.

Colours steady, without alteration in prices. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire, common, 40s, medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

New Companies.

ATKINS' AMALGAMATOR SYNDICATE, LIMITED.—This company was registered on the 4th inst., with a capital of £20,000., in £1. shares, to acquire the inventions of Geo. Jones Atkins with reference to the extraction of gold, silver, and other metals from their ores, and all improvements which he may make therein, and his patent rights in respect of such inventions. The first subscribers are:—

	Shares.
Alderman E. Hart, 14, Moorgate-street, chartered accountant	1
D. Francis, 191 and 192, Gresham House	1
S. Stuttaford, 49, Fore-street, merchant	1
G. J. Atkins, 1, Moselle-gardens, Tottenham, electro metallurgist	1
H. Spencer Moor, 34A, Throgmorton-street, merchant	1
N. Clayden, 50, Caversham-road, N.W., secretary	1
H. S. Hatton, 45, Marlow-road, Anerley, accountant	1

BULLERS, LIMITED.—This company was registered on the 6th inst., with a capital of £200,000., in £10. shares, one-half of which are preference shares. It is a re-construction of the Buller, Jobson, and Co., Limited, electrical, telegraphic, and mechanical engineers. The subscribers are:—

	Shares.
Ernest W. Buller, 49, Charlotte-road, Birmingham, engineer	1
H. C. Jobson, Kidderminster, engineer	1
E. J. Chambers, Dudley, engineer	1
W. Greenhill, Dudley, bank manager	1
A. T. Buller, Penrith, land agent	1
J. T Harris, Stone, Stafford, engineer	1
E. P. Jobson, Dudley, solicitor	1

ELECTRO-METALLURGICAL COMPANY, LIMITED.—This company was registered on the 3rd inst., with a capital of £2,500., in £1. shares, to acquire the businesses of electro-metallurgists, platers, and depositors on metals, carried on the Electro-Metallurgical Company, at 23, Newhall-hill, Birmingham, and by the Victoria Plating Company, at 9 and 10, Sherbourne, Balsall-heath, Birmingham. The subscribers are:—

	Shares.
A. Smallwood, Small-heath, Birmingham, metal merchant	1
A. Gough, 12, Edmund-street, Birmingham, solicitor	1
H. Fenny, 9 and 10, Sherborne-road, Birmingham, stamper	1
W. R. Bradley, 68, Gladstone-road, Birmingham, plater	1
J. G. B. Arter, 26, Waterloo-street, Birmingham, chartered accountant	1
J. H. Fenny, 23, Newhall-street, Birmingham, electro-plater	1
E. G. Waters, 86, William-street, Birmingham, clerk	1

FURNACE GASES COMPANY, LIMITED.—This company was registered on the 4th inst., with a capital of £50,000., in £50. shares, to adopt an unregistered agreement with Messrs. Robert and John Dempster, and to trade as extractors of products from furnace gases, and as tar-distillers, manufacturing chemists, and druggists, and as drysalters. The subscribers are :—

	Shares.
J. Dempster, Newton-heath, Manchester, engineer	1
C. C. Dunkerley, 66, Port-street, Manchester, iron merchant	1
A. C. Briggs, Roundhay, Leeds, colliery-owner	1
W. Warburton, 15, Norfolk-street, Manchester, solicitor	1
C. E. Whitehead, Pendleton, traveller	1
R. A. Hepworth, Cheetham-hill, Manchester, engineer	1
R Dempster, Newton-heath, engineer	1

TRENCH (SALOP) PHOSPHATE COMPANY, LIMITED.—This company was registered on the 4th inst., with a capital of £5,000., in £5. shares, to purchase from William Cooper and G. B. Haddock, their business of slag grinding for manurial purposes, carried on under style of the Trench Phosphate Company, at Wombridge, near Wellington, Salop. The subscribers are :—

	Shares.
W. Underhill, Newport, Salop, engineer	2
G. J. Holland, Newport, Salop, insurance agent	2
R. R. Prince, Newport, Salop, tanner	1
W. L. Matthews, Wellington, Salop, leather merchant	2
J. Purcell, Wellington, Salop, station-master	3
J. Shakeshaft, Waters Ripton, Salop. corn merchant	20
T. G. Best, 26, Preesons-row, Liverpool, merchant	2

Gazette Notices.

PARTNERSHIPS DISSOLVED.

J. KING, JUN., W. KING, and A. J. KING, under the style of W. King and Co., Bollington and Manchester, bleachers and finishers, as far as regards W. King.

H. A. FISHER and F. W. FISHER, under the style of Fisher and Sons, Ramsgate, chemists and druggists.

A. NOBLE, J. BROWN, and W. BROWN, Whitehaven, paint, oil, grease, and soap manufacturers, as far as regards W. Brown.

W. JONES, J. A. JONES, N. LEESE, W. ADKINS, and J. TAYLOR, under the style of Jones Bros. and Co., Stoke-on-Trent, oil and chemical manufacturers, as far as regards J. A. Jones.

W. JONES, N. LEESE, W. ADKINS, and J. TAYLOR, under the style of Jones Bros. and Co., Stoke-on-Trent, oil and chemical manufacturers, as far as regards J. Taylor.

D. Y. CLIFF and C. CLIFF, under the style of J. Cliff and Sons, Runcorn and Leeds, chemical apparatus manufacturers, and fire-brick merchants.

W. TURNER, and W. H GARNER, under the style of Turner, Garner and Co., Manchester, wholesale chemists and druggists.

Receiving Orders.

WOLSTENCROFT, GEORGE HENRY (trading as G. H. Wolstencroft and Co.), Alkrington, near Middleton, Chadderton, near Oldham, and Newhey, near Rochdale, drysalter, dyer, and finisher.

FISHER, THOMAS, Hasland, late in partnership with J. H. Fletcher, as Fisher and Fletcher, colliery proprietors, colliery proprietor.

MARKER, ROBERT HENRY (trading as the Britannia Paint and Colour Company), Swansea, paint and colour manufacturer.

Adjudications.

FISHER, THOMAS, Hasland, in partnership with J. H. Fletcher, as Fisher and Fletcher, colliery proprietors, colliery proprietor.

MARKER, ROBERT HENRY (trading as the Britannia Paint and Colour Company), Swansea, paint and colour manufacturer.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Combustion of Fuel. J. Platt. 15,379. Sept. 29.
Charging Gas Retorts. J. F. Braidwood. 15,388. Sept 29.
Utilising Silicic Fluoride obtained in Superphosphate making. E. Richters. 15,394. Sept. 29.
Electric Switches. A. L Sax and C. W. Sax. 15,401. Sept. 29.
Treatment of Sewage. J. Hardwick and L. A. Newton. 15,405. Sept. 29.
Burning Cements. F. H. Rosher. 15,407 Sept. 29.
Manganate of Soda. R. D. Bowman. 15,416. Sept. 29.
Electric Welding.—(Complete Specification). W. P. Thompson. 15,455. Sept. 30.
Electric Welding.—(Complete Specification). W. P. Thompson. 15,456. Sept. 30.
Electric Batteries.—(Complete Specification). H. H. Lake. 15,482. Sept. 30.
Explosives. H. H. Lake. 15,483. Sept. 30.
New Chemical Liquid for Use in Combination with an Apparatus. A. J. Romero. 15,518. Oct. 1.
Annealing Metallic Castings. H. B. Fletcher. 15,520. October 1.
Electric Switches. J. B. Iliffe and F. Teague. 15,547. October 1.
Ventilation. W. B. Macdonald. 15,556. October 1.
Smoke Arrester. D. Appleton. 15,571. October 2.
Manufacture of Aluminium. J. Spence. 15,582. October 2.
Inducing Circulation of Water in Steam Generators. B H. Thwaite. 15,591. October 2.
Brick Making Machinery. H. Tuke. 15,560. October 2.
Apparatus for Supplying Air under Pressure. W. Cole. 15,604. Oct. 2.
Do. do. do. W. Cole. 15,605. Oct. 2.
Manufacture of Dextrin. S. Wohle. 15,620. October 2.
Electric Meters. J. Wetter. 15,634. October 2.
Recovering Sulphur from Alkali Waste. Thos. Goode and A. Smith. 15,637. October 2.
Secondary Batteries. E. Hancock and A J. Marquand. 15,640. October 2.
Production of Sulphydrate of Calcium.—(Complete Specification). J. Leith. 15,648. October 3.
Evaporation of Liquids. F. Garside. 15 659. October 3.
Dyeing Brown Colours. J. R. Geigy. 15,671. October 3.
Treatment of Noxious Gases from Shoddy Making. L. Kern. 15,684. October 3.
Manufacture of Paper from Marsh Reeds. A. W. Hayles. 15,697. Oct. 4.
Apparatus for Concentrating Liquids. R. A. Robertson (of the firm of the Mirrlees, Watson, and Yaryan Co.), and D. Ballingall. 15,698. October 4.
Charging and Drawing Gas Retorts. E. T. Ruthven-Murray. 15,742. October 4.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 4th.

Alkali—

France,	100 c.	Arnati & Harrison
,,	110	,,

Antimony Ore—

Pt. Douglas,	30 t.	W. Balchin
Brisbane,	4	Vivian, Younger & Co.
N. Zealand,	29	Coml. Lighterage Co.
Holland,	20	Vivian, Younger & Co.

Acetic Acid—

Holland,	95 pks.	A. & M. Zimmermann
,,	25	Beresford & Co.

Brimstone—

Italy,	30 t.	G. Nicholson
,,	200	Brandram Bros. & Co.
,,	15	G. Boor & Co.
France,	5	R. Morrison & Co.
Italy,	150	G. Ward & Sons
,,	400	Seager, White & Co.

Barytes—

Holland,	22 cks.	Props Scott's Wf.
France.	85 bgs.	L. & N.-W. R. Co.
Holland,	90 cks.	T. T. Creed
Belgium,	100 bgs.	E. & G. Birch & Co.
Germany,	45 cks.	W. Harrison & Co.

Borax—

Germany,	£42	F. Stahlschmidt & Co.

Bones—

Sydney,	3 t.	Leach & Co.
Jamaica,	25	H. Langridge & Co.
E. Indies,	61	T. H. Allan & Co.

Caustic Potash—

France,	15 pks.	Petri Bros.
,,	5	Beresford & Co.
,,	21	F. W. Berk & Co.

Caoutchouc—

Portugal	31 c.	Prop. Sun. Wf.
,,	13	Anderson, Weber, & Smith
Zanzibar,	109	Wallace Bros.
,,	37	Forbes, Forbes & Co.
,,	39	L. & I. D. Jt. Co.
Batoum,	40	,,
U S.,	58	Mildred, Goyeneche & Co.
Zanzibar,	45	Lewis & Peat
Tamatave,	7	Arbuthnot, Latham & Co.
Singapore,	53	Prop. Bull Wf.
,,	101	Aschenheim & Fubrken
France,	20	Flageollet & Co.
,,	45	H. Grey, junr.
U. S,	85	Stiebel Bros.
,,	300	R. M. S P. Co.
Zanzibar,	265	W M. Smith & Sons
Singapore,	234	Kaltenbach & Schmitz

Cream of Tartar—

Italy,	10 pks.	B. & F. Wf. Co., Ld
France,	2	E. W. Carling & Co.
Spain,	3	B. & F. Wf. Co, Ld.

Copper Ore—

Pt. Douglas,	14 t.	W. Balchin
Germany.	12	R. M. S. P. Co.

Caustic Soda—

Holland,	225 c.	Beresford & Co.

Chemicals *(otherwise undescribed)*

Holland,	£45	Phillipps & Graves
,,	20	,,
Germany,	34	T. H. Lee
,,	220	A. & M. Zimmermann
,,	80	Petri Bros.
,,	5	T. H. Lee
,,	45	W. Burton & Sons
,,	800	A. & M. Zimmermann
Holland,	7	Phillipps & Graves
Germany,	110	T. H. Lee
,,	240	A. & M Zimmermann
,,	89	Phillipps & Graves

Dyestuffs—

Fustic

Colon,	18 t.	Churchill & Son
Carthagena,	139	,,

Argols

Italy,	400 pks.	Thames S. T. & L. Co, Ld.
,,	400	,,
Austria,	285	,,
Cape Town,	26	Horne & Co

Sumac

Italy,	100 pks.	Hicks, Nash, & Co
,,	485	Beresford & Co.
,,	150	J. Kitchin, Ld.

Sumac—*Continued.*

,,	75 pks.	Sawer. Mead, & Co.
,,	200	Beresford & Co.
,,	50	Baxter & Hoare
,,	550	W. France & Co.
,,	150	J. Knill & Co.
,,	610	Beresford & Co.
,,	300	A. Hagan
,,	50	L. & N.-W. Rly. Co.

Myrabolams

E Indies,	540 pks	Lewis & Peat
,,	667	Marshall & French

Gambier

Singapore,	634 pks.	W. H. Cole & Co.
,,	689	Beresford & Co.
,,	178	Brinkmann & Co.
,,	191	Elkan & Co.
,,	211	R. & J. Henderson
,,	186	L. & I. D. Jt. Co.
,,	91	Beresford & Co.
,,	236	Prop. Butler's Wf.
E. Indies,	127	L. & I D. Jt. Co.

Cochineal

Canaries,	14 pks.	A. Jiminez & Co.
,,	5	W. M. Smith & Sons
,,	53	W. H. Cole & Co.
,,	11	W. M. Smith & Sons

Indigo

E. Indies,	57 chts.	L. & I. D. Jt Co.
,,	4	,,
,,	8	Arbuthnot & Co.
,,	26	L. & I. D. Jt Co.

Madders

Holland,	1 pk.	W. Milburn & Co.
,,	1	J. Smidt

Dystuffs—*continued.*

Extracts

France, 20 pks. T. H. Lee
Belgium, 5 ,,
Denmark, 1 Bailey & Leetham
U. S., 100 Skilbeck Bros.
France, 150 A. J. Humphrey
Austria, 100 ,,
Belgium, 50 L. J. Levinstein & Sons

Tanners' Bark

Germany, 10 t. Bevington & Sons
N. Russia, 12 W. F. Malcolm & Co.
Belgium, 26 Leach & Co.
,, 11 G. S. N. Co.
,, 17 Sawer, Mead & Co.
Melbourne, 22 Baxter & Hoare
Adelaide, 118 ,,

Cutch

Rangoon, 4 pks. Berryman & Turnbull

Valonia

Smyrna, 48 t. J. Graves
,, 45 A. J. Humphrey

Logwood

Jamaica, 5 t. E. D. & F. Man
,, 19 Dobree & Sons
,, 14 T. Hankey & Co.

Glycerine—

Germany, £365 Beresford & Co.
,, 70 H. Lambert
Belgium, 25 Arnati & Harrison
Holland, 5 W. Bush
,, 460 Spies Bros. & Co.
Germany, 60 Beresford & Co.

Glucose—

Germany, 25 pks. 420 cwts. L. Sutro & Co.
,, 20 156 Pillow, Jones & Co.
,, 200 200 J. Barber & Co.
France, 100 100 Dutrulle & Co.
,, 100 100 Hyde, Nash & Co.
U. S., 500 500 A. Dawson
,, 80 440 L. Sutro & Co.
,, 40 225 C. Southwell & Co.
,, 90 205 L. Sutro & Co.
Germany, 200 200 Baxter & Hoare
U. S., 110 621 R. G. Hall & Co.
France, 120 672 Botolph & Nich's Wf.
U. S., 250 250 Perkins & Homer
Germany, 400 400 Trier, Meyer & Co.
U. S., 110 621 L. Sutro & Co.

Gutta Percha—

Singapore, 232 c. Soundy & Son
Demerara, 272 N. Waterhouse & Sons
Singapore, 300 J. H. & G. Scovell
,, 190 G. Ward & Sons
,, 212 Soundy & Son
,, 570 H. W. Jewesbury
,, 872 Kaltenbach & Schmitz

Isinglass—

U. S., 31 pks. W. M. Smith & Sons
France, 6 H. Gluck & Co.

Manganese Ore—

Germany, 2 t. Union Lighterage Co.

Manure—

Belgium, 300 t. Anglo-Contl. Guano Works
,, 20 S. F. Waters & Co.
Germany, 100 A. Hunter & Co.
Holland, 50 Anglo-Contl. Guano Works
U. S., 7 C. A. & H. Nichols

Phosphate Rock

U. S., 2,100 t. Anglo-Cntntl. Guano Works

Naphtha—

Holland, 2 drs. Stein Bros.
Belgium, 15 cks. Lister & Biggs
,, 7 drs. Domeier & Co.
,, 8 brls. Stein Bros.

Nitre—

Germany, 6 cks. Craven & Co.

Paraffin Wax—

U. S., 100 brls. G. H. Frank
,, 102 Rose, Wilson & Co.
,, 190 H. Hill & Sons
Germany, 50 cs. ,,
U. S., 2,605 brls. J. H. Usmar & Co.

Plumbago—

E. Indies, 296 cks. Thredder, Son & Co.
,, 320 Prop. Chmblin's. Whf.
Singapore, 96 Elkan & Co.
Holland, 30 cs. J. Barber & Co.
China, 82 cks L. & I. D. Jt. Co.
E. Indies, 193 brls. Sawer, Mead & Co.
Italy, 10 cks. W. Harrison & Co.
Germany, 45 Prop. Scott's Wf.

Pyrites—

Spain, 2,441 t. C. Tennant, Sons & Co.

Potash Salts—

Germany, £123 Beresford & Co.

Potassium Sulphate—

Germany, 40 pks. E. Cook & Co.
France, 21 Weatherley, Mead & Co.
Germany, 508 Anglo-Cntnt. Guano Works

Potashes—

Montreal, 115 c. Charles & Fox

Pearl Ashes—

Montreal, 70 c. Charles & Fox
France, 40 Petri Bros.
Holland, 190 F. W. Berk & Co.

Potassium Bicarbonate—

Holland, £60 A. & M. Zimmermann

Pitch—

France, 70 cks. H. Hill & Sons

Saltpetre—

Germany, 6 cks. Craven & Co.
,, 72 P. Hecker & Co.
,, 118 ,,
,, 5 ,,

Stearine—

Holland, 64 bgs. H. Hill & Sons
France, 70 ,,

Sodium Hyposulphite—

Germany, £55 Beresford & Co.
Holland, 53 J. James & Son
,, 50 S. Lambert & Co.

Saltpetre Nitrate—

Germany, £40 H. Lambert

Salts of Lead—

Germany, £45 H. Lambert

Tar—

N. Russia, 1,796 brls. W. F. Malcolm & Co.
Sweden, 4,200 ,,
,, 340 C. Price & Co.

Tartar—

Italy, £800 Thames S. T. & L. Co., Ltd.
,, 800 ,,

Tartaric Acid—

Holland, 7 pks. Middleton & Co.
Italy, 20 B. & F. Wf. Co., Ltd.

Ultramarine—

Holland, 8 cs. Haeffner, Hilpert & Co.
Belgium, 5 Magee, Taylor & Co.
,, 4 W. Harrison & Co.
,, 4 cks. Leach & Co.
Germany, 10 cs. H. Brooks & Co.
Belgium, 10 W. Harrison & Co.

Zinc Oxide—

Germany, 5 cks. Girard Bros. & Co.

LIVERPOOL.

Week ending Oct. 7th.

Antimony—

Smyrna, 1,400 bgs.

Albumen—

Rouen, 4 cks. Co-op. W'sale Society

Borax—

Hamburg, 5 brls.

Bone Meal—

Bombay, 1,000 bgs.

Boracic Acid—

Leghorn, 60 cks.
,, 22

Bone Ash—

Valparaiso, 41 sks. Cockbain Allardice & Co.
Rio Grande do Sul, 198 t. J. Gordon & Co.
Campana, 643 bgs.

Bones—

Boston, 133 bgs.
Rio Grande do Sul, 215,200 J. Gordon & Co.
Smyrna, 44 t.

Barytes—

Antwerp, 20 bgs.
,, 21 cks.

Cream of Tartar—

Rotterdam, 4 cks.

Copper Ore—

Galveston, 3,200 sks J. Lewis & Son
Lisbon, 1,000 bgs. Richardson & Co.

Charcoal—

Antwerp, 190 bgs.
Rotterdam, 110
Antwerp, 85
Rouen, 400 Co-op. W'sale. Society

Caoutchouc—

Rangoon, 266 bgs.
Accra, 16 brls. J. J. Fischer & Co.
,, 30 cs. J. P. Werner
,, 3 Pickering & Berthoud
,, 6 Hutton & Co.
,, 5 F. & A. Swanzy
,, 8 Edwards Bros.
,, 6 M. Herschell & Co.
Winnebah, 3 F. & A. Swanzy
Salt Pond, 1 W. Griffiths & Co.
,, 1 2 Edwards Bros.
Cape Coast, 2 7 Miller, Son & Co.
,, 3 J. Smith & Co.
,, 4 Challenor & Co.
,, 3 Morduant Bros.
,, 4 Kimloch Campbell
,, 1 W. Symington & Co.
,, 16 Fletcher & Fraser
,, 2 J. W. Jepps & Co.
,, 1 2 C. Lane & Co.
,, 2 1 S. Henrichsen & Co.
,, 1 F. Richter & Co.
,, 21 A. Miller, Bros. & Co.
,, 12 Grimwade & Ridley
,, 5 Ihlers & Bell
,, 5 A. Millerson & Co.
,, 16 43
Dixcove, 2 F. & A. Swanzy
,, 1 Edwards Bros.
Monrovia, 1 ck E. & H. Verspreeuven
Sierra Leone, 4 Paterson, Zachonis & Co.
,, 2 Pickering & Berthoud
Cape Coast, 12 brls. M. Duff & Co.
,, 16 L. Hart & Co.
,, 2 Davies, Robbins & Co.
,, 4 Edwards Bros.
,, 2 cs. 12 W. B. McIvor & Co.
,, 2 C. L. Clare & Co.
,, 10 Ellis & Co.
,, 1 F. & A. Swanzy
,, 2 Taylor Laughland
,, 2 Radcliffe & Durant
,, 4 E. T. Bennet & Co.
,, 1 4 W. D. Woodin
,, 2 T. E. Tomlinson & Co.
,, 2 H. B. W. Russell
,, 2 F. J. Eaton & Son
Para, 184
Boma, 1 ck. Valle Avezedo
Ambriz, 1 bg. Samson & de Liagre
,, 2 6 Taylor Laughland & Co
,, 5 T. Millington
,, 3 Vermuth & Stock
,, 3 Samson & de Liagre
Mussera, 4 ,, ,,
,, 9 Taylor, Laughland & Co.
Ambrizette, 14 ,, ,,
,, 8 J. Holt & Co.
,, 11 Samson & de Liagre
Muculla, 3 Taylor, Laughland & Co.
,, 21 Samson & de Liagre
Loango, 3 Edwards Bros.
Sette Cama, 32 Hatton & Cookson
Old Calabar, 9
Batanga, 6 J. Holt & Co.
Batta, 5 ,, ,,
Victoria, 1 Ambas Bay Co.
Bibundi, 2 L. Hart & Co.
Bereby, 1 cs.
Sierra Leone, 2 brls. Pickering & Berthoud
,, 21

Chemicals (*otherwise undescribed*)

Rotterdam, 7 cks.

Dyestuffs—

Argols

Oporto, 45 cks. German Bank, London

Logwood

Hamburg, Brownbill & Co.

Myrabolams

Bombay, 352 bgs.

Sumac

Palermo, 150 bgs. J. Kitchin, Ld.
,, 1,150 ,,
,, 290 ,,

Annatto

Bordeaux, 3 cks.

Valonia

Smyrna, 50 t. S. Virante & Co.
,, 98 Barry, Bros. & Co.
,, 775 bgs.

Yellow Berries

Smyrna, 50 bgs.

Extracts

Antwerp, 36 pks.
Colon, 50 cs. E. Chesnay & Co.

Cutch

Rangoon, 698 bxs.
,, 698

Fustic

Savanilla, 860 bgs. G. H. Rutter & Co.

Alizarine

Rotterdam, 4 cks.

Dried Blood—

B. Ayres, 660 bgs.
River Plate, 700 bgs.

Glucose—

Hamburg, 100 bgs.
Rouen, 5 cks. Co-op. W'sale Society, Ltd.

Guano—

Rouen, 30 bgs. Co-op. W'sale Society, Ltd.

Glycerine—

Marseilles, 2 cks. H. Appleby

Horn Tips—

Boston, 42 bgs.

Horn Piths—

Rio Grande do Sul, 10,900 J. Gordon & Co.

Isinglass—

Para, 39 cs. Bieber & Co.
,, 15 Frith, Sands & Co.

Mangnese Ore—

Carrizal Bajo, 924 t.

Manure—

Valparaiso, 120 sks. Cockbain, Allardice & Co.

Oxalic Acid—

Rotterdam, 8 cks.

Potash Salts—

Hamburg, 583 bgs.

Plumbago—

Hamburg, 11 brls.

Pyrites—

Huelva, a qnty. Matheson & Co.
,, 1 390 t. Tennants & Co.

Potash—

Rouen, 78 cks. Co-op. W'sale Society, Ltd.
Montreal, 12 bxs. Makin & Bancroft

Pitch—

Rouen, 56 cks. Co-op. W'sale Society, Ltd.
Rotterdam, 50

Paraffin Wax—

Rouen, 10 cs. Co-op. W'sale Society, Ltd.
New York, 109 brls.
Rangoon, 418 bxs.

Saltpetre—

Hamburg, 50 cks.
Antwerp, 135 bgs. J. T. Fletcher & Co.

Soap—

Colon, 1 cs.
Leghorn, 35 300 bxs.

Stearine—

Antwerp, 39 bgs.

Sodium Nitrate—

Iquique, 2,412 bgs. Cockbain, Allardice & Co.

Tartar—

Bordeaux, 2 cks.
Naples, 3 ,,

Tartaric Acid—

Trieste, 10 brls. Wright, Crossley & Co.
,, 12 ,,

Talc—

Trieste, 30 bgs.

Turpentine—
Savannah, 500 brls.
" 1,333
Ultramarine—
Rotterdam, 4 cks. 15 cs.
" 2
Waste Salt—
Hamburg, 155 t.
Zinc Oxide—
Antwerp, 5 brls. J. T. Fletcher & Co.
" 10 25 cks.
Terneuzen, 30

HULL.

Week ending October 9th.

Alumnia Sulphate—
Rotterdam, 41 cks. W. & C. L. Ringrose
Barytes—
Bremen, 20 cks. Blundell, Spencer & Co.
Antwerp, 30 cks. Bailey & Leetham
" 81 H. F. Pudsey
Chemicals *(otherwise undescribed)*
Antwerp, 125 pks. Wilson, Sons & Co.
Dunkirk, 24 "
" 11 cks.
Hamburg, 5 49 pks. Wilson, Sons & Co.
Bremen, 18 pkgs. 31 brls. 5 cs. 4 cks. Veltmann & Co.
Genoa, 10 cks. Wilson, Sons & Co.
Marseilles, 25 "
" 4
Dyestuffs—
Alizarine
Rotterdam, 23 pks. W. & C. L. Ringrose
" 13 pks. W. & C. L. Ringrose
" 3 cks. 2 cs. Hutchinson & Son
" 1 pcl. G. Lawson & Sons
" 1 keg W. & C. L. Ringrose
Sumac
Marseilles, 100 bgs. Wilson, Sons & Co.
Madders
Rotterdam, 2 cks. J. Pyefinch & Co.
Glycerine—
Dunkirk, 102 cks. Wilson, Sons & Co.
Amsterdam, 5 pks.
Glucose—
Stettin, 60 cks. Wilson, Son & Co.
" 1,200 bgs. C.M.Lofthouse&Co.
" 100 35 cks.
Rotterdam, 70 Hutchinson & Son
Manure—
Ghent, 100 t. Wilson, Sons & Co.
Permanganate—
Rotterdam, 10 cks. G. Lawson & Sons
Pitch—
Amsterdam, 40 cks. H. F. Pudsey
Saltpetre—
Hamburg, 60 cks. Wilson, Sons & Co
" 10 kegs. C. M. Lofthouse & Co.
" 4 cks.
Soda—
Rotterdam, 8 cks. W. & C. L. Ringrose.
Tar—
Uleaborg, 250 brls.
" 1,535
Marseilles, 30 cks.
Turpentine—
Hamburg, 1 brl. Wilson, Sons & Co.
Ultramarine—
Bremen, 1 cs. J. Pyefinch & Co.
Rotterdam, 3 cks. G. Lawson & Sons

TYNE.

Week ending October 8th.

Alum Earth—
Hamburg, 18 Tyne S. S. Co.
Barytes—
Antwerp, 41 cks. Tyne S.S. Co.
Rotterdam, 46 "
Copper Precipitate—
Pomaron, 222 t. Mason Barry & Co.
Saltpetre—
Hamburg, 9 cks. Tyne S.S. Co.
Soap—
Malmo, 10 cs.
Sulphur Ore—
Pomaron, 978 t. Mason, Barry & Co.
Zinc Oxide—
Antwerp, 25 brls. Tyne S.S. Co.

GLASGOW.

Week ending October 9th.

Alum—
Rotterdam, 41 cks. J. Rankine & Son
Borax—
Rouen, 19 cs.
Barytes—
Rotterdam, 60 cks.
Chrome Ore—
Ourmelia, 2,530 t. J. & J. White
Carbonic Acid—
Rotterdam, 15 cylinders J. Rankine & Son
Dyestuffs—
Alizarine
Rotterdam, 24 cks. 2 cs.
" 77 1
Extracts
Antwerp, 5 cks.
Madders
Rotterdam, 2 cks. J. Rankine & Son
Glucose—
New York, 20 brls.
Glycerine—
Rotterdam, 5 cs. 5 bllns. J. Rankine & Son
Manganese—
Rotterdam, 3 cks.
Naphtha—
Amsterdam, 2 pks.
Phosphate—
Antwerp, 250 t.
Soap—
Nantes, 1 ck.
New York, 25 crates.
Stearine—
Antwerp, 64 bgs.
Tar—
Amsterdam, 315 pks.
Tartar—
Oporto, 3 cks.
Ultramarine—
Rotterdam, 1 ck. J. Rankine & Son
Waste Salt—
Hamburg 150 t.
Zinc Oxide—
Hamburg, 25 cks.
Rotterdam, 15
Antwerp, 25 brls.

GOOLE.

Week ending Oct 1st.

Alumen Sulphate—
Antwerp, 37 cks.
Dextrine—
Hamburg, 100 bgs.
Dyestuffs—
Alizarine
Rotterdam, 44 cks.
Logwood
Jamaica, 610 t.
Belize, 505
Monte Christi, 365 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 47 cks. 54 cs. 7 pks.
Naphthylamine—
Rotterdam, 11 cks.
Potassium Muriate—
Rotterdam, 10 cks.
Potash—
Calais, 22 drms. 21 cks.
Dunkirk, 20
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 25 cks.
Sulphur—
Antwerp, 10 cks.
Waste Salt—
Hamburg, 1,019 bgs, 220 t. 1,380 cks.

GRIMSBY.

Week ending Oct. 4th.

Albumen—
Hamburg, 5 cks.
Pitch—
Dieppe, 5 cks.
Zinc Ashes—
Antwerp, 24 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 1st.

Ammonia—
Madras, 1 cs. £8
Antwerp, 4 10
Ammonium Sulphate—
Emmerich, 208 t. 10 c. £1,280
Bordeaux, 25 9 290
Ammonium Carbonate—
Bremen, 36 brls. 10 cs. £18c
Dunkirk, 21 c. 32
Alum—
Wellington 3 cs. £14
Aniline Oil—
Barcelona, 2 t. 3 c. £220
Acids *(otherwise undescribed)*
Natal, 29 pks. £24
Singapore, 15 cs. 11
Acetic Acid—
Melbourne, 6 cs. £11
Borax—
Sydney, 5 c. £7
" 18 cs. 72
Hamburg, 1 4
Sydney, 1 1
Bleaching Powder—
Rockhampton, 150 t. £1,597
Bisulphate of Lime—
Rangoon, 34 c. £35
Blue Stone—
Sydney, 40 c. £37
Carbolic Acid—
Treport, 1 t. 19 c. £147
Hong Kong, 10 dms. 5
Rotterdam, 143 426
Bordeaux, 16 tubes. 40
Rotterdam, 1 ck. 8
Pt. Said, 4 drms. 5
Caustic Soda—
Odessa, 250 dms. £233
Caustic Soda—*continued.*
New Orleans, 203 c. £120
Rockhampton, 19 48
Copper Sulphate—
Antwerp, 100 c. £90
Odessa, 329 282
Bombay, 20 25
Cream of Tartar—
Fremantle, 2 c. £14
Sydney, 40 210
Melbourne, 39 kgs. 129
" 22 100
Townsville, 10 55
Fremantle, 4 22
Citric Acid—
Penang, 1 c. £8
Jersey, 49 crbys. 108
Calcutta, 1 7
St. Petersburg, 20 150
Danzig, 5 38
Libau, 3 27
Melbourne, 11 70
Odessa, 1 7
Brussels, 3 kgs. 22
Cologne, 1 7
Coal Products—
Pitch
Rotterdam, 177 cks. £547
Auckland, 3 t. 10 c. 17
Helsingfors, 100 138
Boston, 1,600 brls. 735
Antwerp, 116 154
Dunkirk, 150 225
" 105 158
Dinsburg, 125 209
Sables d'Olmue, 1,200 t. 2,355
Calcutta, 15 brls. 11
Legan, 151 t. 200
Benzole
Rotterdam, 53 cks. £605
Terneuzen, 24 t. 16 c. 730
Rotterdam, 52 cks. 955
Calais, 10 160
Stockholm, 5 dms. 131
Tar
Hamburg, 175 brls. £100
Jersey, 1 1
Sydney, 70 80
Rangoon, 220 rlts. 128
" 200 107
Helsingfors, 800 373
Canaries, 5 cks. 2
E. London, 6 4
Danzig, 250 130
St. Vincent, 5 dms. 2
Norrkoping, 800 475
Rangoon, 16 14
Anthracene
Rotterdam, 252 cks. £2,318
Dusseldorf, 66 420
Rotterdam, 31 250
Naphthaline
Hamburg, 5 t. 3 c. £50
Treport, 52 cks. 200
Hamburg, 20 t. 1 50
Rotterdam, 343 bgs. 85
Hamburg, 229 55
Calais, 20 cks. 194
Hamburg, 134 68
Hamburg, 100 68
Chemicals *(otherwise undescribed)*
Brisbane, 12 cks. £16
Durban, 7 pks. 22
Auckland, 12 87
Flushing, 1 cs. 16
Lisbon, 12 118
Vigo, 3 60
Barcelona, 12 107
Shanghai, 2 2
Natal, 2 2 bgs. 14 pks. 16
Melbourne, 20 kgs. 131
Adelaide, 10 8
Disinfectants—
Singapore, 5 pks. £15
Hong Kong, 5 cs. 27
Pt. Natal, 1 26
Hong Kong, 50 c. 30
Suez, 3 10
Hydro Carbon—
Brussels, 12 c. £10
Manure—
Treport, 20 t. £142
Rouen, 55 190
Rochefort, 215 1,000
Treport, 10 78
Hamburg, 31 11 c. 250
Rotterdam, 9 15 90
St. Nazaire, 521 5,425
Nitric Acid—
Madras, 1 cs. £12
Potash—
Gothenburg, 5 c. £11
Suez, 7½ 12
Potassium Chlorate—
Rangoon, 20 c. £43
Danzig, 6 14
Saltpetre—
Varna, 20 c. £21
Adelaide, 50 55
Sydney, 5 8
Lisbon, 4 4
Amsterdam, 41 47
Gibraltar, 300 318
Sheep Dip—
Natal, 125 drms. £39
Pt. Natal, 500 125 c. 386
Cape Town, 6 14
Algoa Bay, 400 28 pks. 126
Natal, 10 bxs. 24
Algoa Bay, 300 256
E. London, 200 25 cs. 111
Natal, 50 130
Sulphuric Acid—
Barbadoes, 13 drms. £15
Las Palmas, 4 crbys. 4
Hong Kong, 20 c. 8
Penang, 36 9
Sodium Sulphate—
Norrkoping, 300 t. £300
Ghent, 50 50

Sodium Bicarbonate—
B. Ayres, 5 t. £38
Moulmein, 20 c. 7
Rockhampton, 50 16
Soda Crystals—
Sydney, 66 c. £12
Salammoniac—
Bourgas, 9 c. £15
Batoum, 24 42
Sodium Hyposulphate—
Melbourne, 100 c. £31
Sulphur Flowers—
Algoa Bay, 4 t. 9 c. £43
Sulphur—
Melbourne, 5 dms. £20
E. London, 40 kgs. 17
Tartaric Acid—
Penang, 1 c. £8
Melbourne, 10 67
Adelaide, 10 71
Melbourne, 11 65
Freemantle, 2 15

LIVERPOOL.

Week ending Oct. 4th.

Alkali—
Boston, 74 tcs.
Havre, 52 cks.
Rotterdam, 27
Alum Sulphate—
Philadelphia, 5 t. 19 c. £30
Ammonium Carbonate—
Barcelona, 10 c. 1 q. £16
Genoa, 8 13
Hamburg, 1 t. 3 33
Leghorn, 10 16
San Francisco, 2 11 1 84
Rangoon, 7 2 16
Ammonium Sulphate—
Nantes, 36 t. 5 c. £425
Valencia, 53 12 2 q. 596
New York, 105 15 1,253
Albumen—
New York, 18 c. £7
Santos, 11 3 q. 45
Antimony Regulus—
Rotterdam, 1 t. 10 c. 105
" 4 1 285
Alum—
Seville, 1 t. 2 c. £6
Montreal, 14 13 75
Bombay, 9 5 48
Santander, 5 25
Beyrout, 2 5 1 q. 12
Syra, 3 15 1 19
Ammonia—
Coquimbo, 2 c. £9
Ammonia Salts—
New York, 9 t. £180
Acetic Acid—
Santos, 13 c. 1 q. £12
Antimony Salt—
Toronto, 10 c. £8
Bleaching Powder—
Bilbao, 20 kgs.
Bombay, 8 cs.
Bordeaux, 51 cks.
Boston, 87 tcs.
Callao, 1
Havre, 25
Leghorn, 24
Malaga, 5
New York, 39
Rouen, 131
Alexandria, 10 brls.
Ancona, 99
Antwerp, 100
Barcelona, 18
Bombay, 10
Boston, 458
Calcutta, 75
Genoa, 35
Hamburg, 45
Montreal, 23
Naples, 67
New York, 94
Odessa, 10 3
San Francisco, 332
Borax—
Rotterdam, 2 t. 3 q. £59
Montreal, 2 2 c. 62
Pachuca, 8 11
Amsterdam, 7 3 10
Antwerp, 2 2 2 57
New York, 6 5 2 172
Valencia, 1 1 28
Rouen, 27 2 754
Borate of Lime—
Rotterdam, 10 t. 1 c. £110
Hamburg, 10 6 93
Brimstone—
Para, 10 c. £5
Madras, 67 brls. 57
Bone Waste—
Rouen, 2 t. 5 c. £12
Carbolic Acid—
Amsterdam, 6 c. £35
Rouen, 1 t. 2 95
Caustic Potash—
Monrteal, 2 t. 8 c. £53
Caustic Soda—
Algoa Bay, 23 drms.
Almeria, 6
Amsterdam, 100
Antwerp, 17
Barcelona, 50 50 cks.
Batavia, 27
Beyrout, 20
Bombay, 27
Boston, 1,075
Brindisi, 25
Brisbane, 60
Calcutta, 176
" 50
Cardenas, 6
Catania, 55
Dunedin, 45
Galatz, 50
Genoa, 60
" 55
Ghent, 16
Guelph, 25
Hamburg, 36
Havana, 50
La Guayra, 20
Leghorn, 70
Lisbon, 20
Manilla, 172
Melbourne, 39
Messina, 25
Montreal, 50 pks.
Napier, 8 bxs.
Naples, 20
New Orleans, 100
New York, 850 50
Penang, 350
Rotterdam, 92
St. Petersburg, 232 150 kgs.
San Sebastian, 100
Sourabaya, 35
Stockholm, 2
Trieste, 64
Acajutla, 8
Antwerp, 33
Boston, 207
Calcutta, 178
Carthagena, 6
Cirenfuegos, 6
Dunedin, 23
Genoa, 90
Havana, 20 15
Lisbon, 105
Malaga, 100
Montreal, 787 68 cks.
Naples, 15
New Orleans, 300
New York, 250
Odessa, 25
Oporto, 10
Otago, 7
Pasages, 100
Rio de Janeiro, 20
Rotterdam, 10
Rouen, 25
Sydney, 36
Wellington, 25
Bahia, 10
Copperas—
Constantinople, 3 t. 15 c. £10
Mauritius, 11 t. 19 c. 25
Alexandria, 3 15 8
Calcutta, 27 7 60
Messina, 7 14 3 q. 17
San Francisco, 29 t. 10 c. 48
Syra, 6 19 15
Alexandretta, 3 5 7
Piræus, 4 9
Copper Sulphate—
Montreal, 5 t. £86
Odessa, 5 2 c. 2 q. 90
Barcelona, 2 1 1 35
Calcutta, 5 90
Bordeaux, 10 2 178
San Juan, 4 2 5
SanSebastian, 4 19 1 90
Sydney, 5 98
Venice, 20 7 3 411
St. Petersburg, 10 4 3 180
Leghorn, 20 1 381
Catania, 2 10 43
" 7 10 3 156
Palermo, 8 3 2 141
Odessa, 1 5 1 23
Bombay, 2 10 53
St. Petersburg, 20 1 3 393
Venice, 20 1 3 367
Copper Sulphate—*continued.*
Montreal, 9 t. 3 c. 3 q. £175
Bari, 2 11 2 48
Genoa, 81 9 3 1,444
Ghent, 10 190
Hamburg, 40 2 1 762
Melbourne, 12 10 230
Nantes, 54 10 3 1,090
Barcelona, 10 3 373
Calcutta, 5 7 92
Naples, 6 3 100
Rouen, 77 15 1,550
Carbolic Crystals—
Havre, 60 btls. £50
Charcoal—
Nantes, 50 t. 250
Calcutta, 11 c. 1 q. 7
Dunkirk, 9 16 3 47
Hamburg, 51 238
Cream of Tartar—
St. Johns, 1 c. £6
Chemicals *(otherwise undescribed)*
New York, 2 t. 16 c. £90
Vera Cruz, 9 1 q. 41
Rio de Janeiro, 9 29
Naples, 3 8
Santos, 2 16
Disinfectants—
St. Johns, 1 c. £5
Rio de Janeiro, 20 cs. 16
Talcahuano, 1 c. 2 q. 10
Calcutta, 4 t. 15 26
Rangoon, 20 cks. 13
Epsom Salts—
Havana, 10 brls.
Montreal, 20
Odessa, 7 20 kgs.
Rio de Janeiro, 50
Bombay, 51 cks.
Gypsum—
New York, 10 t. £30
Ground Spar—
Hamburg, 100 t. 4 c. 763
Guano—
Valencia, 119 t. 10 c. 1q. £1,167
Hydrochloric Acid—
Coquimbo, 2 c. £7
Magnesia—
Rio de Janeiro, 50 cs.
Manure—
Barbadoes, 5 t. £55
Genoa, 29 11 c. 97
Havre, 250 2 3 q. 1,363
Landeonder, 171 7 654
Rochefort, 400 1,347
Magnesium Chlorate—
Bangkok, 16 c. 2 q. £9
Rangoon, 3 t. 8 1 37
Nitric Acid—
Coquimbo, 2 c. 1 q. £11
Oxalic Acid—
Barcelona, 5 t. 1 c. £167
New York, 13 10 457
Rouen, 2 75
Potassium Silicate—
Amsterdam, 1 t. 4 c. 2 q. £10
Potassium Stannate—
Bombay, 18 c. 1 q. £77
Potassium Chlorate—
St. Petersburg, 5 t. £220
Progreso, 1 10 c. 92
Philadelphia, 5 223
Boston, 5 223
New York, 12 10 564
Hamburg, 1 5 55
Potashes—
Catania, 1 t. 14 c. £39
Potash Nitrate—
Carthagena, 4 t. 16 c. £84
Potash Crystals—
Barcelona, 4 t. 14 c. 1 q. £135
Pitch—
Bordeaux, 224 t.
Brindisi, 2,561
Potassium Carbonate—
Cienfuegos, 2 c. 1 q. £5
Sugar of Lead—
Santos, 7 c. £9
" 7 2 q. 8
Sodium Hyposulphate—
Iquique, 18 t. 7 c. 1 q. £115
Sodium Chlorate—
Montreal, 2 t. £21
Sheep Dip—
B. Ayres, 7 t. 11 c. £202
Calcutta, 90 drs. 50
Owen Sand, 5 cks. 23
Bombay, 20 10
Sodium Nitrate—
Carthagena, 1 t. £9
Bari, 2 2 c. 18
Trieste, 12 9 3 q. 107
Sodium Biborate—
Hamburg, 12 t. 5 c. 2 q. £368
Montreal, 1 1 3 32
Amsterdam, 1 1 3 34
St. Petersburg, 5 5 158
Saltpetre—
Para, 1 t. £23
Maranham, 11 c. 2 q. 13
Vera Cruz, 8 3 10
Zante, 1 10 32
Bahia, 1 2 28
Salammoniac—
Barcelona, 1 t. 3 q. £35
Constantinople, 1 4 c. 45
Calcutta, 1 12 57
Patras, 9 3 17
Mersyne, 4 2 3
Alexandria, 2 14 3 94
Patras, 5 3
Rotterdam, 9 1 17
Soda Crystals—
Calcutta, 98 brls.
Constantinople, 50
Montreal, 45 kgs.
New York, 374
Brantford, 3 cs.
New York, 12 brls.
Philadelphia, 280 cks.
Rosario, 100
Soap—
Port Natal, 4 bdls. 710 bxs.
St. Johns, Nfld. 1 65
St. Lucia, 41
Tangiers, 55
Teneriffe, 506
Valparaiso, 1 cs.
Zanzibar, 2,010
Corfu, 10
Constantinople, 1
Calcutta, 10 bdls.
Accra, 50
Algoa Bay, 21 2,200
Amsterdam, 100
Antigua, 120
Antwerp, 14
Barbadoes, 500
Bombay, 500
Bushire, 75
Calcutta, 2 cs.
Cape Coast, 25 2
Cape Town, 600
Colon, 100
Curacoa, 50
E. London, 7 3,350
Gaboon, 100
Gr. Canary, 520
Guayaquil, 400
Kurrachee, 790
Lagos, 50
Leghorn, 15
Loanda, 90
Maceio, 75
Mauritius, 991
M. Video, 40 dms.
New York, 4
Port Elizabeth, 200
Akassa, 40
Algoa Bay, 175
B. Ayres, 3
Calcutta, 153
E. London, 27
" 22
Ferrol, 50
Gibraltar, 300
Limassol, 6
Livingstone, 50
Madras, 100 15
Patras, 3 pks.
Piræus, 10 11
St. Thomas, 50
Trinidad, 70
Valparaiso, 1
Greytown, 225
Soda Ash—
Baltimore, 250 tcs.
Barcelona, 120 brls.
Boston, 86
Dunedin, 124 cks.
Ghent, 12
Havana, 2
Leghorn, 53
Melbourne, 64
Montreal, 105
New York, 146 883
Odessa, 20 kgs. 107
Oporto, 15 pps.
Otago, 22 cks.
Philadelphia, 93
Portland, 50
Porto Alegre, 100

Soda Ash—*continued.*
Rio de Janeiro, 130 brls.
Santos, 2 25
Smyrna, 150
,, 125
Syra, 135
Wellington, 25
Baltimore, 281 220
Mahi, 25
Naples, 21
Santos, 30

Sodium Bicarbonate—
Bahia, 40 bgs.
Bordeaux, 60 kgs.
Dunedin, 145
Madras, 60
Montreal, 534 5 cks.
Wellington, 50
Amsterdam, 6
Ancona, 20
Antwerp, 55 10
Barcelona, 150
Bremen, 14
Genoa, 25
Hamburg, 50
Rosario, 400
Rotterdam, 5

Salt—
Addah, 5 t.
Algoa Bay, 5
Amsterdam, 117
Antwerp, 45
Baltimore, 150
Belize, 25
Calcutta, 593
Cape Coast, 13
E. London, 22
Livingstone, 40
Melbourne, 50
M. Video, 4
Montreal, 406
New York, 1,300
Para, 142 16 c.
Philadelphia, 120
Portland, 1, 508 10
Rio de Janeiro, 2 13
Rosario, 2 2
Rotterdam, 272
Rouen, 10
St. John's, 499 10
San Francisco, 150
Toronto, 20
Akassa, 500
Anamaboe, 5
Astoria, 100
Baltimore, 95
Banana, 15
Bk. Point, 48
Boston, 200
Cape Coast, 32
Chicago, 72
Demerara, 45
Elsinore, 126
Ghent, 132
Hamburg, 30
Landana, 6
Loango, 8
Malta, 10
Manaos, 19 12
Montreal, 483
Opobo, 45 10
Point Levi, 20
Salt Pond, 5
Sierra Leone, 108
Valparaiso, 4 5
Wellington, 67 10
Montreal, 150 3
Sydney, 206

Sodium Carbonate—
Alexandria, 60 brls.
Boston, 56
Hamburg, 7 8 kgs.
Montreal, 61
New York, 40

Sodium Silicate—
Havre, 21 brls.
Volo, 5

Soap Powder—
Dunkirk, 50 bxs.

Sulphur—
Boston, 25 t. 1 c. £125
Rouen, 10 7 55

Sodium Manganate—
New York, 5 c. 1 q. £5

Salt Cake—
Baltimore, 75 t. 5 c. £185
Dunnedin, 10 8 2 q. 24

Sulphuric Acid—
Guayaquil, 5 c. 1 q. £7

Tannic Acid—
Santos, 3 c. 1 q. £24

Zinc Chlorate—
Rotterdam, 5 t 8 c. £36

Zinc Muriate—
Bombay, 17 cks. £152

TYNE.

Week ending October 8th.

Ammonium Carbonate—
Antwerp, 1 t. 2 c.

Antimony—
Hamburg, 11 t. 4 c.
Copenhagen, 10

Alkali—
Genoa, 7 t. 1 c.
Reval, 2 19
Antwerp, 8 2
Hamburg, 5 7
Gothenburg, 22 6

Arsenic—
Genoa, 1 t. 1 c.

Alumina Sulphate—
Montreal, 50 t. 4 c.
,, 20 1
,, 30 7

Alum—
San Francisco, 20 t.

Ammonium Sulphate—
Genoa, 30 t.

Bleaching Powder—
Abo, 5 t. 17 c.
Lornas, 40 5
Antwerp, 35 8
Hamburg, 15 7
,, 82 15
San Francisco, 70 9
Copenhagen, 15 4
,, 25 6
Ghent, 14 14
New York, 14 17
Rotterdam, 9
,, 7 15
,, 13 17
Stettin, 70 7

Barytes Caronbate—
Copenhagen, 5 t.
Stettin, 10
,, 75

Calcined Magnesia—
Genoa, 5 c.

Caustic Soda—
Genoa, 2 t. 18 c.
Reval, 8 14
Abo, 3
Helsingfors, 4 19
Montreal, 10 3
Hamburg, 3
Copenhagen, 1 9
New York, 156
Stettin, 2 18

Charcoal—
Christiania, 2 t. 6 c.

Dyestuffs—
Alizarine
New York, 6 t. 17 c.

Epsom Salts—
Gothenburg, 1 t.

Gypsum—
New York, 91 t. 16 c.

Glycerine—
Rotterdam, 7 t. 10 c.

Litharge—
Genoa, 10 c.
Montreal, 5 t. 5
,, 5
,, 24 18
Antwerp, 1 13
Christiania, 11
Gothenburg, 16 c.
Copenhagen, 5
Lisbon, 3 3
Helsingfors, 6
Stettin, 1 1

Magnesia—
Hamburg, 2 t. 3 c.
New York, 2 9

Potassium Chlorate
Hamburg, 10 c.

Pitch—
Bilbao, 6 t. 6 c.

Phosphorus—
Malmo, 8 c.

Paraffin Wax—
Malmo, 3 t. 12 c.

Soda Ash—
Abo, 54 t. 18 c.
Antwerp, 2 6
Hamburg, 15 7
,, 13
Christiania, 3 10
,, 5
San Francisco, 49 17
Gothenburg, 91 14
Copenhagen, 10 10
New York, 145 9
Stettin, 9 17

Sodium Chlorate—
Hamburg, 1 t. 5 c.

Sulphur—
Helsingfors, 10 t.
Hamburg, 13
Rotterdam, 10 2

Soda—
Abo, 8 t. 17 c.
Montreal, 7 10
Esbjerg, 25 t. 2 c.

Sodium Hyhosulphate
San Francisco, 8 t.

Sodium Sulphate—
Copenhagen, 50 t. 5 c.
Nykjobing, 13 3
Rotterdam, 17 13
6 15

Soda Crystals—
Aarhuus, 29 t. 14 c.
Genoa, 6 2
Smyrna, 10 15

HULL.

Week ending Oct. 7th.

Alkali—
Bremen, 20 drms.
Bari, 42 cks.
Mesinna, 10
Stettin, 14

Bone Size—
Bremen, 20 cks.

Bleaching Powder—
Drontheim, 70 cks.

Caustic Soda—
Christiania, 16 drms.
Gothenburg, 18
Libau, 190
Rotterdam, 8
St. Petersburg, 450

Chemicals *(otherwise undescribed)*
Antwerp, 17 cks.
Amsterdam, 8 pks.
Bremen, 6
Bordeaux, 20 cs.
Copenhagen 40
Christiania, 29 59 1 311 slbs.
Christiansand, 635
Dunkirk, 16 1
Gothenburg, 9 cs.
Genoa, 80 6
Hamburg, 50 bgs. 46 cks. 25 pks 46cs.
Konigsberg, 38 cks. 10 pks.
Libau, 5 20
Leghorn, 7 cs.
Naples, 10
New York, 12 200 kgs 100
Rotterdam, 4 23 pks. 51
Stockholm, 100
Stettin, 75
St. Petersburg, 11 200 6
Trieste, 1 7
Venice, 4

Dyestuffs *(otherwise undescribed)*
Antwerp, 2 cks.
Christiania, 4
Hamburg, 1 cs. 7 drms.
Konigsberg 5 t.

Manure—
Dunkirk, 33 t.
Eshjerg, 297
Hamburg, 200 bgs.
Rouen, 96
Stettin, 200

Pitch—
Antwerp, 63 t.
Genoa, 340 cks.
Leghorn, 182 t.

Tar—
Amsterdam, 3 cks.
Copenhagen, 10
Hamburg, 3
Rotterdam, 6

GRIMSBY.

Week ending October 4th.

Coal Products—
Dieppe, 30 cks.

Chemicals *(otherwise undescribed)*
Dieppe, 42 cks.

GLASGOW

Week ending October 9th.

Ammonium Carbonate—
Christiania, 5 kgs. £10

Ammonium Sulphate—
Philadelphia, 39 t. 19½ c. £420
Perang, 30 11¼ 375
Valencia, 238 17¾ 3,874

Chrome Ore—
Italy, 10 t. £67

Chemicals *(otherwise undescribed)*
Karachi, 5 t. 6 c. £51

Epsom Salts—
Christiania, 50 bgs. £20

Fero Silicon—
Fiume, 20 t. £125

Gutta Percha—
Amsterdam, 182 lbs. £15

Glucose—
Bombay, 12 t. 12 c. £205

Manganese—
Rouen, 5 t. 1 c. £48

Manganese Oxide—
Philadelphia, 11 t. 13¼ c. £98

Naphtha—
Rouen, £315

Nitric Acid—
Bombay, 26¾ c. £43. 15s.

Plumbago—
Rangoon, 1 t. £46

Pitch—
Rouen, 60 t. 7 c. £46
Halifax, 20
Karachi, 19 13 62
Oporto, 40 2¼ 40

Potassium Bichromate—
Antwerp, 12 t. 17¼ c. £304
Rouen, 36 6½ 1,025
Dunedin, 64 cks. 858
Italy, 584½ c. £962
New York, 513 897
Quebec, 220 380
Boston, 498 872

Potassium Prussiate—
New York, 5 t. 8¾ c. £361
Italy, 16¼ 63

Paraffin Wax—
Rouen, 29 t. 17¼ c. £1,030
Italy, 66 17 1,513

Potassium Iodide—
Quebec, 4¾ c. £72

Soap—
New York, 85 c.
Rangoon, 35¼ 28£

Sulphuric Acid—
Rangoon, 16 t. 6 c. £161
Penang, 8 9¾ £37. 15s.
Bombay, 112½ £28
Karachi, 7 10 37

Sodium Bichromate—
Italy, 1,072½ c. £1,333
New York, 993 1,274
Quebec, 106 150

Tar—
Rangoon, 272 c. £54
Karachi, 31 t. 6 106

GOOLE.

Week ending Oct. 1st.

Bleaching Preparations—
Ghent, 27 cks.

Benzole—
Rotterdam, 24 cks.

Coal Products—
Antwerp, 10 cks.
Rotterdam, 20

Chemicals *(otherwise undescribed)*
Dunkirk, 25 cks.
Ghent, 21
Hamburg, 120

Manure—
Antwerp, 261 bgs.
Boulogne, 73

Pitch—
Antwerp, 736 t.

PRICES CURRENT.

WEDNESDAY, OCTOBER 15, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. *at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.*

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	8
,, (Cylinder), 30° Tw. .. .. ,,	0	2	11
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3½
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	6	6
,, (free from arsenic, 140/145°) .. .. ,,	1	10	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	11	3
Aniline Oil (pure) .. .. per lb.	0	0	11
Aniline Salt ,, ... ,,	0	0	10
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	5	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. per gallon	0	4	4½
,, 50/90 ,, ... ,,	0	3	4
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6½
,, (crude 60°) .. .. per gallon	0	1	7
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	58	10	0
,, Sulphate .. .. ,,	19	10	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	16	0	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	10	0
,, ,, (brown ,,) .. .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	19	15	0
Nitrate .. .. ,,	21	15	0
Lime, Acetate (brown) .. .. ,,	7	7	6
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	4
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	4½
Oils:—			
Cotton-seed .. .. per ton	21	0	0
Linseed .. .. ,,	25	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5¼
,, American .. .. ,,	0	0	5½
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton.	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	0
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	3	10	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	1¾
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	17	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	5	0
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	15	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	12	6
,, ,, (60 % Caustic Soda) .. .. ,,	10	12	6
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	6	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	31	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	5	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	101	0	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	24	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	7	6

THE

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Notices.

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Advertisements intended for insertion in the current week's issue, should reach the office by **Wednesday morning** at the latest.

Communications for the Editor, if intended for insertion in the current week's issue, should reach the office not later than **Tuesday Morning.**

Articles, reports, and correspondence on all matters of interest to the Chemical and allied industries, home and foreign, are solicited. Correspondents should condense their matter as much as possible, write on one side only of the paper, and in all cases give their names and addresses, not necessarily for publication. Sketches should be sent on separate sheets.

We cannot undertake to return rejected manuscripts or drawings, unless accompanied by a stamped directed envelope.

Readers are invited to forward items of intelligence, or cuttings from local newspapers, of interest to the trades concerned.

As it is one of the special features of the *Chemical Trade Journal* to give the earliest information respecting new processes, improvements, inventions, etc., bearing upon the Chemical and allied industries, or which may be of interest to our readers, the Editor invites particulars of such—when in working order—from the originators; and if the subject is deemed of sufficient importance, an expert will visit and report upon the same in the columns of the *Journal*. There is no fee required for visits of this kind.

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Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates :—

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Trade Advertisements, Announcements in the Directory Columns, and all Advertisements not prepaid, are charged at the Tariff rates, which will be orwarded on application.

DECAY OF BOILERS.

MANY explosions of boilers would not have occured if closer attention had been given to the deterioration of the boiler caused by the general or local decay of the material. A boiler when new may have a factor of safety of six; but it must be remembered that with the beginning of the life of a boiler decay also begins, and the original margin of safety is gradually reduced by the ever progressing decay caused by corrosion; and if this decay is allowed to progress too far an explosion is sure to take place.

Corrosion does not always attack the surface of steel and iron plates in a uniform manner, hence the decay is more likely to be local than general. This difference in corrosion is probably due to the structural difference in the plates; they are not always perfectly homogeneous, being prevented from becoming so by the nature of the processes of manufacture. For instance, the fibres of iron are welded together by squeezing, hammering and rolling, which sometimes allow the fibres to be separated by thin layers of impurities. The innumerable air and gas cells in steel ingots, more or less perfectly welded together by hammering and rolling, also prevent a perfect homogeneous structure; and it is fair to assume that the imperfect structure of the material is one of the causes of local corrosion. But in steam boilers there are other causes for local decay; for instance, a thin scale tends to protect the plates, but this scale often becomes detached in local places, leaving the clean iron exposed to corrosive action which rapidly progresses. Again the fibres of the metal may have been loosened by bending, hammering, etc., all of which tends to accelerate corrosion.

Plates are effected in various ways by corrosion; frequently small cavities are formed in the plate, the depth varying from a shallow depression to an actual perforation of the plate. In some cases the cavities lie far apart; in others they are close together, giving the plate a honeycombed appearance. This phenomenon is called pitting, and may be caused by surface defects due to cinder spots, etc., but frequently it is due to the intense local action of fatty acids, or other particles of corrosive substances; in some cases the cause of pitting is attributed to the galvanic action of particles of heterogeneous metals.

From the foregoing it appears that to prevent pitting, good material only should enter into the construction of the boiler, and if pitting then occurs the water should be analyzed, and if necessary, changed; and greasy substances should not be allowed to enter into the boiler.

Frequently the corrosion forms deep furrows parallel and close to the seams; this phenomenon is called grooving or furrowing. In nearly every case this furrowing occurs under the water line, and in horizontal boilers with lap joints; the grooves are deepest along the horizontal seams. Probably the chief cause for furrowing is a chemical action, because it does not occur with all kinds of water, and it rarely occurs above the water line. But this chemical action is accelerated by a mechanical action which tends to change the form of the shell of the boiler, bending or springing the plates along the seams; but the bending of the plates may break off the incrustation, or even the outside scale of the plate itself, thus continuously exposing a fresh surface of the metal to the chemical action of the water.

The mechanical action may be due to the constantly occurring variation of the pressure as steam is made or blown off, or it may be produced by the changes of temperature; and if this change of form goes on continually, though ever so slightly, along the same line, the mechanical action of itself must finally produce rupture.

Furrowing is often due to the carelessness of calking, by which the skin of the under plate is cut; careless workmen should not be permitted to use a calking tool.

Furrowing is probably the most dangerous kind of corrosion. In Professor R. H. Thurston's Manual of Steam Boilers we find that of forty explosions of locomotive boilers noted in the British Board of Trade reports, eighteen gave way at the fire-box and twenty at the barrel. Of these twenty every one was the result of grooving or cracks along the lap of seams, all of which were lap joints.

In order to prevent furrowing all seams should be placed above the water line whenever it is possible to do so. In plain horizontal cylindrical boilers there should be no trouble in placing the horizontal seams above the water line, and the transverse seams should have welt pieces placed over the joints up to the water line. In fact, all lap joints which cannot be placed over the water line should have inside welt pieces put over them. That welt pieces greatly reduce and sometimes completely stop furrowing has been amply demonstrated in locomotive practice.

Pitting in a local part of a boiler is not necessarily an indication that it has also occurred in many other parts, but it does demand an immediate and careful inspection of the boiler so as to determine the cause and extent of the injury, and steps must be taken to prevent it.

Frequent and careful inspections of the boilers are absolutely necessary; they will pay in the end and avoid disastrous explosions.—*American Machinist.*

MAGNESIA AS A FERTILIZER.

THE last number of the *Bulletin des Agriculteurs de France* contains an interesting communication by M. Joulie on this subject, which we reproduce here because of the importance attaching to the opinion of this eminent chemist.

The utility of magnesia for cereals and vegetation in general has been long known. To go no further back, Boussingault in 1851 gives in his *Economie rurale* a table of analyses of the ashes of various plants, in which the column devoted to magnesia contains numbers varying from 10% for hemp-seed to 17% for maize. The ashes of wheat contain, according to the same table, 15·9% of magnesia. It has been the custom for the last thirty years in the most elementary lectures to state that the ash of wheat is almost exclusively made up of phosphates, potashes, and magnesia. M. Joulie himself has always given the percentage of magnesia present whenever he has had occasion to publish the analysis of a soil or plant, and the importance of this element, especially for the production of grain, cannot be unknown to anyone. This is therefore a sufficient reason for agriculturists to go to the expense of adding magnesia to the soil, and including it in the composition of fertilizers, whenever the land in question is insufficiently supplied with it.

M. Joulie is not quite decided as to the exact proportion of magnesia which a fertile soil ought to contain, but he does not hesitate to advise the use of a magnesia fertilizer, whenever the soil contains less than 0·05 per cent., say 2,000 kilos. per hectare (2½ acres), in a layer 20 centimetres thick. In any case he would seldom have to give such advice, for soils which are as poor as this are rare.

The determination of magnesia in soils is somewhat difficult, and the processes given in works on the subject do not usually give exact results. Many soils are therefore set down as deficient in this ingredient which are actually well supplied with it. Speaking generally, magnesia fertilizers are, according to M. Joulie, quite useless. In cases where magnesia is actually deficient, on the other hand, they are of the greatest value. Very remarkable results can then be obtained by putting down 200 kilos. of sulphate of magnesia to the hectare, the cost of this being 11-12 francs per 100 kilos. The same object may also be attained by using the residue from the manufacture of chloride of potassium, which comes into the market under the name of kainite, and consists of a mixture of potassium sulphate, magnesium sulphate, and sodium chloride. This material contains 10-12% of potash, and about as much magnesia. The good results obtained by its use (for any soil) do not establish the utility of the magnesia, because it is always possible that they may be due to the potassium. The efficacy of magnesium sulphate when used alone, however, settles the question even more decisively than would a chemical analysis.—*L'Engrais.*

THE NEW AMERICAN TARIFF.

(Concluded from Page 242.)

SCHEDULE C.

METALS AND MANUFACTURES OF IRON AND STEEL.

	Old Rate.	*New Rate.*
Chromate of iron	15 p.c.	15 p.c.
Iron ore, per ton	75 c.	75 c.
Iron sulphur ore containing not more than 3½ p.c. of copper, per ton	75 c.	75 c.
More than 2 p.c. of copper, in addition on the copper	2½ c.	½ c.
Iron in pigs and kentledge, scraps	3-10 c.	3-10 c.

MISCELLANEOUS METALS AND MANUFACTURES.

Aluminum, crude and alloys	Free	15 p.c.
Antimony, regulus or metal	10 p.c.	¾ c.
Argentine albata or German silver	25 p.c.	25 p.c.
Brass bars or pigs, old brass, yellow metal fit only for remanufacture	1½ c.	1¼ c.
Bronze powder	15 p.c.	12 p.c.
Bronze or Dutch metal in leaf, per 100 leaves	10 p.c.	8 c.

COPPER.

Copper ores	2½ c.	1½ c.
Old copper for remanufacture	3 c.	1 c.
Regulus of copper and copper cement	3½ c.	3½ c.
Copper in plates, bars or ingots not manufactured	4 c.	1¼ c.
Copper in rolled plates, rods, pipes, sheathing	35 p.c.	35 p.c.

GOLD AND SILVER.

Bullions and metal thread	25 p.c.	30 p.c.
Gold leaf, per pack 500 leaves	1 dol. 50 c.	2 dols.
Silver leaf, per pack 500 leaves	75 c.	75 c.

LEAD.

Lead ore and lead dross	1½ c.	1½ c.
Provided that silver ore and all other ores containing lead shall pay a duty of 1½ c. per pound on lead therein.		
in pigs and bars, molten and refuse	2 c.	2 c.
in sheets, pipes, shot	3 c.	3 c.
Metallic mineral substances, metals unwrought, not specially provided for	20 p.c.	20 p.c.

NICKEL.

Nickel, nickel oxide alloy	15 c.	10 c.
Tin, black oxide, bar, block, and pig, on and after January 1, 1893	4 c.	4 c.

ZINC OR SPELTER.

Zinc, in blocks or pigs	1½ c.	1¾ c.
in sheet	2½ c.	2½ c.
Old for remanufacture	1½ c.	1¼ c.
Manufactures or wares not specially provided for, wholly or in part of metal	45 p.c.	45 p.c.

SALT.

Salt, in packages, per 100 lbs.	12 c.	12 c.
In bulk, per 100 lbs.	8 c.	8 c.
(Provided that imported salt may be used in curing fish and the duties be remitted, and further provided that exporters of meat may use imported salt, and have duties refunded on amounts not less than 100 dollars.)		
Starch, and substances fit for use as	2 c.	2 c.
Dextrine, burnt starch, gum substitute	1 c.	1 c.

There shall be allowed on the imported tin plate used in the manufacture of cans, boxes, packages, and all articles of tinware exported, either empty or filled with domestic products, a drawback, equal to the duty paid on such tin plate, less one per cent. of said duty, which shall be retained for the use of the United States.

SCHEDULE II.

SPIRITS WINES AND OTHER BEVERAGES.

SPIRITS.

	Old Rate.	*New Rate.*
Anhydrous alcohol, per gallon	1·00 dol.	2·50 dols.
Brandy and spirits distilled, per gallon	2·00 dols.	2·50 dols.

Each and every gauge or wine gallon of measurement shall be counted as, at least, one proof gallon, and the standard for deter-

mining the proof of brandy and other spirits or liquors of any kind imported, shall be the same as that which is defined in the laws relating to internal revenue, but any brandy or other spirituous liquors, imported in casks of less capacity than fourteen gallons, shall be forfeited to the United States, provided that it shall be lawful for the Secretary of the Treasury in his discretion to authorize the ascertainment of the proof of wines, cordials, or other liquors by distillation or otherwise, in case where it is impracticable to ascertain such proof by the means prescribed by existing law or regulations.

On all compounds or preparations of which distilled spirits are a component part of chief value, not specially provided for in this act, there shall be levied a duty not less than that imposed upon distilled spirits.

Cordials, liquors, arrack, absinthe, kirchwasser, ratafia and other spirituous beverages or bitters of all kinds containing spirits, per gallon, 2 dols., 2·50 dols.

No lower rate or amount of duty shall be levied, collected, and paid on brandy, spirits, and other spirituous beverages than that fixed by law for the description first of proof; but it shall be increased in proportion for any greater strength than the strength of the first proof, and all imitations of brandy or spirits or wines imported by any names whatever, shall be subject to the highest rate of duty provided for the genuine articles respectively intended to be represented, and in no case less than 1·50 per gallon.

Bay rum or bay water of first proof, and in proportion for any greater strength than first proof, per gallon, 1 dol., 1·50 dols.

	Old Rate.	*New Rate.*
Ale, porter and beer, in bottles or jugs, per gallon	35 c.	40 c.
Otherwise than bottles and jugs, per gallon	20 c.	35 c.
Malt extract, fluid, in casks, per gallon	20 p.c.	20 c.
In bottles or jugs, per gallon	20 p.c.	40 c.
Solid or condensed	20 p.c.	40 p c.

Manna.
Marrow, crude.
Marsh mallows.
Mineral waters, all not artificial.
Minerals, crude, or not advanced by manufacture.
Myrobolam.
Nux vomica.
Oilcake.

Oils.—Almond, amber, crude and rectified ambergris, anise or aniseseed, aniline, aspic or spike lavender, bergamont, cajeput, carraway, cassia, cinnamon, cedrat, chamomile, citronella or lemen grass, civet, fennel, jasmine or jasimine, juglandium, juniper, lavender, lemon, limes, mace, neroli or orange flower, nut oil or oil of nuts (25 p.c.), orange oil, olive oil for manufacturing or mechanical purposes, unfit for eating (25 p.c.); ottar of roses, palm and cocoanut, rosemary or anthoss, sesame or sesamum seed or bean, thyme, origanum, red or white; valerian, and also spermaceti, whale and other fish oils of American fisheries, and all other articles the produce of such fisheries.

Olives, green or prepared.

Opium, crude or manufactured, and not adulterated, containing 9 p c. and over of morphia (1 dol.)

Orange and lemon peel, not prepared.

Orchil, or orchil liquid.

Ores, of gold, silver, and nickel and nickel matte (15c). Provided that ores of nickel and nickel matte, containing more than 2 p.c. of copper, shall pay a duty of one-half of one cent (2½c.) per pound on the copper contained therein.

Osmium.
Palladium.
Paper stock, crude, of every description.
Paraffine.
Pewter and britannia metal, fit only to be remanufactured.
Phosphates, crude or native.
Plaster of Paris and sulphate of lime, unground.
Platina, in ingots, bars, sheets and wire.
Platinum, unmanufactured, and apparatus of platinum for chemical uses.
Plumbago.

Potash, crude, carbonate of, or "black salts" (6 p. c.). Caustic potash, or hydrate of, not including refined, in sticks or rolls (20 p.c.). Nitrate of potash, or saltpetre, crude (1c.). Sulphate of potash, crude or unrefined (20 p c.). Chlorate of potash (3c.). Muriate of potash (free).

Professional books, implements, instruments and tools of trade, occupation, or employment, in the actual possession at the time of persons arriving in the United States.

Pulu.
Pumico.
Quills.
Quinia, sulphate of, and all alkaloids or salts of cinchona bark.
Saffron and Safflower, and extract of, and saffron cake.
Sago, crude, and sago flour.
Salacine.

Seeds, anise, canary, caraway, cardamon, coriander, cotton, cummin, fennel, fenugreek, hemp, horehound, mustard, rape (¼ c.), St. John's bread or bean, sugar, beet, turnip, mangel wurzel, sorghum, or sugar cane for seed, bulbs, and bulbous roots, not edible, (20 p. c), and all flower and grass seeds.

Soda, nitrate or cubic nitrate and chlorate.
Sodium.
Storax, or styrax.
Strontia, oxide; protoxide, strontianite.

Sugars, all not above number thirteen Dutch standard in colour, all tank bottoms, all sugar drainings and sugar sweepings; syrups of cane juice, melada, concentrated melada, and concrete and concentrated molasses and molasses.

Sulphur, lac or precipitated, and sulphur or brimstone crude, in bulk (75 c. per ton), sulphur ore as pyrites, or sulphuret of iron in its natural state, containing in excess of twenty-five per cent. of sulphur (except on the copper contained therein), and sulphur not otherwise provided for.

Sulphuric acid which at the temperature of sixty degrees Fahrenheit does not exceed the specific gravity of one and three hundred and eighty thousandths, for use in manufacturing superphosphate of lime or artificial manures of any kind, or for any agricultural purposes.

Sweepings of silver and gold.
Tar and pitch of wood (10 p.c.) and pitch of coal tar (20 p.c.).
Tin ore and tin in bars, blocks, pigs or grain or granulated, until January 1, 1892.
Tripoli.
Turmeric.
Turpentine, Venice.
Turpentine, spirits of (20 c. per gal.)
Uranium, oxide and salts of.
Valonia.
Verdigris, or subacetate of copper.
Wafers, unmedicated.
Wax, vegetable or mineral.
Zaffer.
Brazil paste.
Bromine.
Burgundy pitch.
Cadmium.
Calamine.
Camphor, crude.
Castor or castoreum.
Catgut, whipgut, or wormgut, unmanufactured or in strings or cord.
Cerium.
Chalk, unmanufactured.
Charcoal.
Clay—common blue clay in casks, suitable only for crucibles, 1·50 dols. per ton.
Coal, anthracite.
Coal tar, crude, 10 p.c.
Cobalt and cobalt ore.
Cocculus indicus.
Cochineal.

Copper, old, taken from the bottom of American vessels in foreign ports.

Cryolite, or kryolith.
Cudbear.
Cutch.
Cuttlefish bone.
Dandelion roots, raw, dried or undried, but unground (1 c.)
Divi divi.
Dragon's blood.

Drugs not advanced in value or condition by refining or grinding, or by manufacture.

Emery ore.
Ergot.
Farina.
Feldspar.
Fibrin, in all forms.
Fish skins.
Fossils.

GRASSES AND FIBRES.

Istle, or Tampico fibre (15 dols. per ton).
Jute (20 p.c.).
Jute butts (5 dols. per ton).
Manila (25 dols. per ton).
Sisal Grass (15 dols. per ton).
Sunn (15 dols. per ton).

All other textile grasses or fibrous vegetable substances, unmanufactured or undressed (15 dols. per ton).—All binding twine manufactured from istle or Tampico fibre, manila, sisal-grass, or sunn.

Grease and oils, such as are commonly used in soapmaking (free), or in wire drawing (10 p c.), or for stuffing or dressing leather (10 p.c.), fit only for such uses.

Guano, manures, and all substances expressly used for manure.

Gutta percha, crude.

Hides, raw or uncured, whether dry, salted or pickled, and skins, except sheepskins with the wool on, Angora goatskins, raw, without the wool, unmanufactured, asses' skins, raw or unmanufactured.

Hide cuttings, raw, with or without hair, and all other glue stock.

Hoofs, unmanufactured.

Horns, and parts of, unmanufactured.

India-rubber, crude, and milk of, scrap or refuse India-rubber.

Indigo.

Iodine, crude.

Ipecac.

Iridium.

Jalap.

Kelp.

Kieserite.

Kyanite, or cyanite, and kainite.

Lac dye, crude, seed, button, stick, and shell.

Lac spirits.

Lactarine.

Lava, unmanufactured.

Lemon juice, lime juice, and sour orange juice.

Liquorice root, unground.

Lime, citrate of

Lime, chloride of, or bleaching powder.

Litmus, prepared or not prepared.

Madder and munjeet, or Indian madder, ground or prepared, and all extracts of.

Magnesite.

Magnesium.

Manganese, oxide and ore of.

	Old Rate.	*New Rate.*
Emery	1c	1 c.
Fulminates	30 p.c.	30 p.c.
Gunpowder and explosives valued at 20 c. or less per lb.	6 c.	5 c.
Above 20 c. per lb.	10 c.	8 c.
Matches, per gross, not more than 100 matches to box	35 p.c.	10 c.
Matches otherwise than above, per thousand	35 p.c.	1 c.
Belting and sole leather	15 p.c.	10 p.c.
Calfskins, dressed upper leather, chamois, finished	20 p.c.	20 p.c.
Bookbinders' Calfskins, kangaroo, sheep, goat, lamb and kid finished	20 p.c.	20 p.c.
Morocco unfinished	10 p.c.	10 p.c.
Jappanned calfskins	30 p.c.	30 p.c.

THE FREE LIST.

Acid used for medicinal, chemical, or manufacturing purposes not specially provided for.

Aconite.

Albumen.

Alizarine, natural or artifical.

Aniline salts.

Annatto, roucou, rocoa, or orleans, and all extract of.

Antimony ore, crude sulphide of.

Apatite.

Argal, or argol, or crude tartar.

Arrowroot, raw or unmanufactured.

Arsenic and sulphide of, or orpiment.

Arseniate of aniline.

Articles in a crude state used in dyeing or tanning.

Articles the growth, produce and manufacture of the United States, when returned after having been exported, without having been advanced in value or improved in condition by any process of manufacture or other means.

Asbestos, unmanufactured.

Ashes, wood and lye of, and beet root.

Asphaltum, and bitumen, crude,

Asafœtida.

Balm of Gilead.

Barks, cinchona or other from which quinine may be extracted.

Baryta, carbonate of or witherite.

Bauxite, or beauxite.

Beeswax (20 p.c.)

Bismuth.

Bladders, crude, and all integuments of animals.

Blood, dried.

Bones, crude or not burned, calcined, ground, steamed, or otherwise manufactured, and bone dust or animal carbon and bone ash, fit only for fertilising

SCHEDULE M.

PULP, PAPERS, AND BOOKS.

PULP AND PAPERS.

	New Rate.	*Old Rate.*
Mechanically ground wood pulp, per ton	10 p.c.	2·50 dols.
Chemical wood pulp, unbleached, per ton	10 p.c.	6·00 dols.
Bleached, per ton	10 p.c.	7·00 dols.
Sheathing paper	10 p.c.	10 p.c.
Printing paper, unsized	15 p.c.	15 p.c.
Sized or glued	20 p.c.	20 p.c.
Cigarette paper	15 p.c.	15 p.c.
Photographers' paper, not sensitized	— —	35 p.c.
Surface coated papers, cardboards, lithographic prints, autograph and scrap albums	25 p.c.	35 p.c.

MANUFACTURES OF PAPER.

Envelopes, per 1,000	25 p.c.	25 c.
Paper hangings, screens, filtering and letter-press copying, albumenized, and sensitised	25 p.c.	25 p.c.
Books, pamphlets, engravings, photographs, etchings, maps, charts, and all printed matter, not specially provided for	25 p.c.	25 p.c.
Blank books	20 p.c.	25 p.c.
Playing cards, per pack	100 p.c.	50 c.
Other manufactures of paper	15 to 35 p c.	25 p.c.

SCHEDULE N.

	Old Rate.	*New Rate.*
Coal, bituminous and shale, per ton	75 p c.	75 p.c.
Coal, slack or culm, per ton	30 p.c.	30 p.c.
Coke	20 p.c.	20 p.c.

FERROUS SULPHATE IN VITICULTURE.

A FRENCH writer in the *Journal of Practical Agriculture* furnishes useful details with regard to the use of sulphate of iron as a remedy for the diseases of the vine. I refer to the subject believing that some information may be gained from the results which have been obtained by the employment of various remedies. If in the French vineyards the action of sulphate of iron has, as we shall see, been so marked in contending against the inroads of the vegetable parasites which attack the grape vine, it is quite possible that it might be of use if employed in connection with some of our own agricultural crops. Be this as it may, the suggestion should be sufficient to induce those who experiment in this direction to test its efficacy. M. Petit, an engineer in the Gironde, made numerous experiments between 1886 and 1889 in the employment of various substances, both in the form of liquid and of powder. The comparative treatments applied to the vine have been as follows :—Sulphate of iron, 50 per cent. ; solution of sulphuric acid, 10 per cent. bouillie Bordelaise, a mixture which has commonly been used in French vineyards, 10 per cent. to 12 per cent.; sulphate of copper 10 per cent. to 15 per cent. ; and lime 15 per cent. In obtaining the results, the quantity of grapes gathered upon a given number of vines has been measured, a certain number of the vines having been submitted to each treatment. The coefficients given in the table below show the value attached to each, the maximum being estimated at 10 :—

Baskets of Grapes Collected from 1,000 Vines.

Substances.	Per cent.	No. of Baskets (5·625 litres each).	Coefficient of success.
Sulphate of iron	50	46·3	9·
Sulphuric acid	10	42·2	7·33
Bouillie Bordelaise	10 to 12	34·4	6·825
Lime	15	34·3	6·5
Sulphate of copper	10 to 15	28·65	6·33
Undressed plot	—	12·	4·66

Thus it appears that the sulphate of iron proves itself incontestably to occupy the first rank as an anti-cryptogamic. In employing substances in the form of powder, M. Petit found the following results were attained, the sulphate of iron again taking the first place, closely followed by sulphate of copper. Here, too, it is valuable to notice that the lime given in larger quantities is of some value :—

Substances.	Per cent.	No. of baskets.
Sulphate of iron	25	66·8
Sulphate of copper	10	55·8
Sulphate of lime	50	48·0

LOADING MATERIALS AND THEIR USES.

LOADING materials are defined as those substances which are added to the pulp in the beater engine, other than pure fibre, and which consequently do not felt together, forming the texture of the sheet of paper.

The opinion is frequently expressed by large consumers of paper that their so called loading materials are added to the pulp in order to increase its weight, and thereby augment the profits of the manufacturer. When they are used, cheapness is aimed at rather than quality of product. Paper is applied to a multitude of purposes, where great durability is not essential and where cheapness is a necessity before all other requirements.

The chief requisites of a loading material are, that it is in a fine state of division, is not acted on by alkalies (resin-size), chlorine or acids and does not act disadvantageously on the fibre by altering the strength of the sheet of paper.

Inorganic and organic substances are both used for loading. The former are mainly mineral earths, whilst the latter are ground wood (mechanical wood pulp) and waste paper. The latter is prepared by grinding very hard sized papers for a long time to a fine powder. The nature of the loading material, and the mode in which it is added to the pulp in the beater engine influences to a great extent the strength of the paper. The resin-size and starch both assist in fastening the loading in the fibre which, in consequence loses in softness and suppleness. The finished paper possesses less strength, as the felting capabilities of the individual fibres are reduced. The quantity of loading substances which can be used, depends upon the weight and strength of the paper to be made, and also on the nature of the loading itself.

It is necessary to add loading materials to many kinds of paper, in order to increase its absorptiveness. Ordinary news printing paper contains as much as 85% loading, in the form of mechanical wood pulp and mineral substances, and 15% of pure fibre. These substances serve to increase its weight and its power to imbibe the printing ink. The preparation of such papers requires much experience, as the large amount of ground wood ordinarily used makes the paper harsher than is desired for the printing type. An addition of some mineral matter is therefore employed to diminish the degree of harshness, and increase its absorptiveness. The small addition of strong pulp (pure fibre) and the consequent low strength of the paper makes it difficult to hit the exact proportions to be used. Experience and long practice can alone guide one to good results. Clay, for example, is added in isolated cases, up to as much as 50%. The paper thus produced absorbs the ink well, and is easily calendered. It yields good printing impressions and the colour or ink dries quickly. Soft sized paper of this composition throws off dust, however, during the printing, and easily smears.

Minerals are also added to the pulp to give the paper greater whiteness. The bright appearance which many papers possess in these days, and which are produced from sulphite wood pulp, is increased by the addition of loading minerals. Medium fine writing papers having this appearance should be free from mechanical wood pulp, refuse fibre, and minerals. Cotton has the same properties and must also be taken for thin papers, as paper waste and mineral substances part with the water but slowly, so that the web of paper adheres too much to the couch roll or wet press.

Mineral and organic loading substances give to the paper a beautiful clear transparency. The cloudiness produced by too long fibre is diminished by their use. In paper prepared with clay, a low pressure suffices for producing the necessary gloss and smoothness. Clay, however, absorbs moisture from the atmosphere, and as quickly parts with it again on change of temperature, so that the gloss and smoothness of the paper rapidly disappear.

China clay, a loading material in great request among papermakers, is obtained free from sand and grit, from the native clay, by repeated washing. It is almost free from iron. Next to mechanical wood pulp, it is the most extensively used loading in the manufacture of printing papers. Its colour, somewhat yellowish at times, answers well the purposes to which it is applied. It is mixed with water to the consistency of thick cream, and is then simply added to the pulp for unsized papers. The loss in the paper machine under such circumstances is large, sometimes more than 50%. To reduce this loss in the preparation of soft sized, *e.g.*, ordinary printing paper, the China clay is first boiled up with starch and frequently with resin-size. The fine particles of resin and mineral float in the thick fluid, absorb the resin-size and fasten themselves on the fibre. The thin layer of pulp next the wire on the wire cloth more effectually prevents the clay passing away with the water; thus preventing undue loss.

In the preparation of hard sized papers and of writing paper, the addition of China clay is limited. The more clay added to such papers the less resisting are they towards ink, because the clay itself absorbs a quantity of resin-size. The resin and resinate of alumina are altered and are not so suitable for sizing the paper. A writing paper was sized with 3% resin without the addition of clay, but when loaded with clay as much as 7% resin was necessary. When clay is introduced into papers their "body" and appearance are altered.

Hard sized papers are prepared with ground *gypsum* (native sulphate of lime) or "*annaline.*" Gypsum, unlike China clay, does not absorb the resin-size, and, consequently, it allows the fibre to receive the full amount of size. Nor does it absorb moisture from the air, and, therefore, the finished paper does not lose its gloss and smoothness so readily. Annaline has also a very pure white colour, which it communicates to the paper. Indeed, the value of annaline depends upon its whiteness and upon the degree of fineness to which it has been ground. The finer it is, the better it answers as a loading material. Low or poor qualities yield a rough paper, and there is much loss occasioned by settling in the sand trap of the paper machine. Besides, when the paper is glazed, its surface is covered with fine glistening particles of annaline. When prepared by washing the ground mineral free from grit, and mixing with starch or resin-size, it does not give the same results as China clay. It is impossible by the most perfect sifting to obtain it in such a fine state as clay, and, as its absorptiveness is less, it is not so much employed for loading printing papers. For writing paper it is better adapted—yielding a somewhat less ragged appearance and firmness.—*Papier Zeitung.*

A METHOD FOR PRODUCING RED DESIGNS ON AN INDIGO GROUND.

THE large demand for cotton fabrics with designs, in which navy blue, associated with red predominates, has led colour chemists to pay attention to the means of producing similar effects with various colouring matters.

As far as concerns certain colours, the problem has found its solution in the process by which an aluminium mordant is added to the discharges which are used to produce white designs on an indigo ground, and then dyeing with alizarine. It appears, however, that up to the present time no method has been found by which indigo can be discharged and at the same time printed with Turkey red. Hitherto, the so-called albuminous colour, *i.e.*, vermilion and red lakes have been used in combination with the well-known discharges.

J. Mullems (Färber-Zeitiug, 1889, p. 97), has recently succeeded in producing the red colour directly on the fabric by employing a method based upon reactions already known, but which have not hitherto been employed for this purpose. The discharge of the indigo is effected by the oxidising action of alkaline potassium ferricyanide. This salt passes into ferrocyanide with loss of oxygen, which, in the nascent state, destroys the blue colour.

If the colours derived from benzene and toluine, which are fixed by cotton without the aid of mordants, could withstand the action of concentrated alkalies, it will readily be understood that they would furnish a means of obtaining discharge patterns in various colours. Mullems remedies their lack of stability in this respect, by the use of silicate of sodium instead of caustic soda.

Commercial silicate of sodium has not, however, given good results. In order to obtain a permanent and light shade of benzopurpurine or Congo red, the silicate must be chemically pure, that is to say it must not contain an excess of caustic soda, and must be in the state of very fine powder.

If alkalies are present, the change of potassium ferricyanide (red prussiate) to ferrocyanide (yellow prussiate) takes place at the ordinary temperature, whereas this change is not required to take place until after the printing. It is therefore obvious that the silicate of sodium must not be in solution when it is applied to the fabric.

The proportions to be employed are :—

Benzopurpurine, or Congo red.....	grammes	42
British gum.....	,,	210
Water.....	,,	488
Ferricyanide of potassium.....	,,	260

The mixture is boiled, and, after cooling, made up with water to 1,000 grammes. Just before printing, 176 grammes of powdered silicate of sodium are introduced, and the whole filtered. After printing, the tissue is exposed for an hour to steam (at 100° C.), then to air, and is finally washed with warm water (40-50° C.) and soap. This last washing is essential to the production of a bright and rigourous red.

Knowing that ammoniacal salts are disassociated by steam with formation of ammonia, it has been proposed to use chloride of ammonium in the hope that the alkali thus rendered free would effect the change of ferricyanide into ferrocyanide. It has, however, been found that the blue cannot be discharged in this way.

The author has obtained satisfactory results by employing powdered stannate of sodium instead of silicate, whilst he has failed in every attempt to make use of the liquid and silicate of commerce.—*Moniteur de la Teinture.*

Official Memoranda.

(From the Board of Trade Journal.)

(Concluded from page 243.)

TRADE BETWEEN SPAIN AND THE UNITED KINGDOM.

Imports into the United Kingdom from Spain.

Principal Articles.		Quantity. Three months ended September. 1889.	Quantity. Three months ended September. 1890.	Value. Three months ended September. 1889.	Value. Three months ended September. 1890.
				£	£
Chemical products, unenumerated ..	Value	—	—	4,248	12,360
Copper, ore and regulus	Tons	20,949	19,389	362,561	457,850
Iron ore	,,	820,678	972,183	586,548	743,727
Lead, ore	,,	690	408	5,770	3,524
,, pig and sheet .	,,	19,111	16,478	243,492	217,176
Manganese ore ..	,,	3,630	1,650	9,210	3,870
Oil, olive	Tuns	1,104	180	37,280	7,212
Pyrites of iron or copper..	Tons	115,414	140,797	225,643	240,783
Quicksilver	Lbs.	132,186	46,952	12,027	5,760
Rags, esparto ..	Tons	13,916	14,172	82,989	82,520
Silver ore	Value	—	—	63,080	51,283
Zinc ore	Tons	—	218	—	926

Exports of British and Irish Produce from the United Kingdom to Spain.

				£	£
Alkali	Cwts.	79,439	86,385	22,797	35,264
Caoutchouc, manufactures of	Value	—	—	5,526	4,647
Cement	Tons	1,737	1,747	3,407	3,425
Chemical products and preparations (including dye-stuffs) .	Value	—	—	14,684	19,621
Clay, and manufactures of	,,	—	—	4,818	4,119
Coals, cinders, and fuel	Tons	358,626	340,043	197,874	242,637
Coal, products of, etc., including naphtha, paraffin, paraffin oil, and petroleum ..	Value	—	—	3,855	8,832
Glass manufactures ..	,,	—	—	2,682	2,992
Grease, tallow, and animal fat	Cwts.	771	6,375	704	7,036
Manure	Value	—	—	27,360	42,865
Painters' colours and materials	,,	—	—	8,734	9,308
Paper of all sorts ..	Cwts.	855	1,410	2,053	3,214
Soap	,,	702	361	789	709

Exports of Foreign and Colonial Produce from the United Kingdom to Spain.

				£	£
Dye-stuffs, indigo ..	Cwts.	313	373	5,433	6,361
Guano	Tons	37	20	353	212
Metal, tin in blocks, etc.	Cwts.	627	743	2,827	3,614
Nitre, cubic	,,	2,161	1,964	937	949
Oil, cocoanut ..	,,	45	571	62	819
,, palm	,,	1,132	2,284	1,132	2,713
Tallow and stearine .	,,	5	5,936	9	7,593

ARGENTIFEROUS LEAD-MINING IN MEXICO.

The *Bulletin de Musée Commercial* for the 13th September contains the following information extracted from a report of the Belgian Legation at Mexico on the subject of the mining of argentiferous lead in Mexico :—

The prohibitive measures taken in the United States to prevent the entry of Mexican argentiferous lead, in place of being unfavourable to Mexico, seems on the contrary to have given a favourable impulse to the mining and metallurgical industry of that country. Not only are new establishments founded on Mexican soil, bnt American foundries and works have changed places and come to Mexico to constitute a new element of wealth.

The erection of blast furnaces at San Luis Potosi is announced, as well as of a reducing factory, which will shortly be established at Monterrey.

The increase or imposition of duties on lead has perhaps served the interests of a few merchants in the United States, but, in general, the adoption of this measure would not appear to be of use to the large majority of consumers ; at all events the development to which the metallurgical industry in Mexico seems to be destined, will amply compensate Mexico for the exclusion to which the export of argentiferous lead has been treated.

The consumption of the United States is certainly very large, and the export of that country obliges it to manufacture enormously in order to maintain its place in the foreign markets ; thus it is probable that the metal industry, which is very much developed in America, will there become more difficult and costly. Under these conditions, it will be more advantageous for native American industry to demand the raw material from a new and neighbouring country, which is there still sold, for different reasons, at a very cheap rate.

If the decree which has burdened Mexican lead on entry into the United States is not repealed, the Americans will find it of advantage to themselves to construct works for reduction and blast-furnaces in Mexico ; the more so as the mines there will always supply an ample provision of ores, which will not pay any duty of a kind to destroy or compromise the equilibrium which must necessarily exist between production and consumption.

It is thus owing to the United States that Mexico will in a short time see flourish on its soil an industry which, owing to the very favourable natural conditions, is destined to a brilliant future.

THE ACTION OF SULPHUR DIOXIDE ON METALS.

By J. Uhl.

PALLADIUM in the form of foil or on asbestos is not attacked by sulphur dioxide at the ordinary temperature. On heating, the following reaction takes place :

$$Pd + 3SO_2 = PdS + 2SO_3.$$

As the palladium rapidly becomes incrusted with sulphur, the action soon ceases.

Platinum behaves in a similar manner, sulphur trioxide and platinum sulphide being formed. Gold, when heated in sulphur dioxide, gives sulphur trioxide and sulphur, which forms a blue solution in the former. The metal appears to be quite unaltered.

Copper, on the other hand, when heated in sulphur dioxide, forms cupric sulphate and cuprous sulphide.

$$3Cu + 2SO_2 = CuSO_4 + Cu_2S.$$

More sulphur than is accounted for by this equation, however, is taken up, to form compounds which are insoluble in water, and a small quantity of a white volatile incrustation is also formed. The author shows that when freshly precipitated dry copper sulphide is heated to a dull red heat in a current of hydrogen, a considerable quantity of the sulphide is reduced to metal. It follows from this that the usual method of determining copper quantitatively as cuprous sulphide after igniting cupric sulphide in a current of hydrogen cannot give accurate results.

Silver and cadmium behave like copper, the sulphate and sulphide of the metal being formed ; in the case of silver a small quantity of free sulphur trioxide is also obtained.

Mercury and bismuth, in agreement with the statement made by Schiff, are not affected by being heated in sulphur dioxide. Magnesium, when heated to faint redness in the gas, burns with a dazzling flame. The residue contains its sulphate, sulphite, and sulphide.

Antimony gives the orange-coloured trisulphide and the trioxide. Aluminium, zinc, nickel, and cobalt also appear to be acted on at a red heat by sulphur dioxide.—*Berichte der Deutsch. Chem. Ges.*, 23, 2,151.

THE TRANSIT OF MATERIALS.

THE increasing tendency of labour to dictate terms to capital is producing one inevitable result. It acts as a stimulus to those whose inventive genius flows easily in the direction of appliances for dispensing with manual labour. A strike of gas stokers invariably results in increasing the number of automatic machines erected to do away with the human stoker. A strike of dock labourers calls attention to the need for appliances, whereby the work can be done without them. Besides these considerations, there are those of increased economy and efficiency, which, in these days of keen competition, turn the balance in favour of automatic machinery.

Prominent among the more recent advances in this direction are the Little and Stevenson's patented appliances for conveying goods and material, now being introduced by the New Conveyor Co., Ltd., 1, Metal Exchange Buildings, E.C.

To describe the various appliances of this firm for the conveyance of sacks and casks, and other material, would occupy too much space. We select, therefore, as an example—which will be of interest—the "Patent Horizontal Conveyor Dryer."

The conveying apparatus in this case is illustrated in Fig. 1, which speaks for itself. It consists essentially of a helical blade revolving in

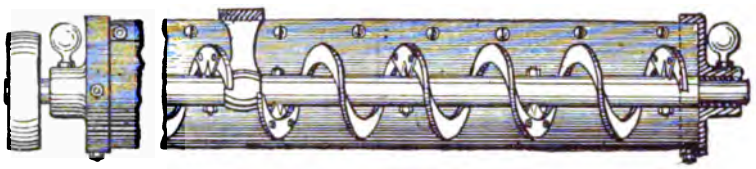

FIG. 1.

a trough, and thus forcing the grain or other substance in a granular or powdery condition from one end of the trough to the other. This principle is applied to various purposes—to the automatic stoking of steam boilers, gas retorts, furnaces, &c., and also to the Patent Conveyor Dryers' for automatically drying grain, sugar, chemicals, tea, scum cakes, white lead, etc, etc.

FIG 2.

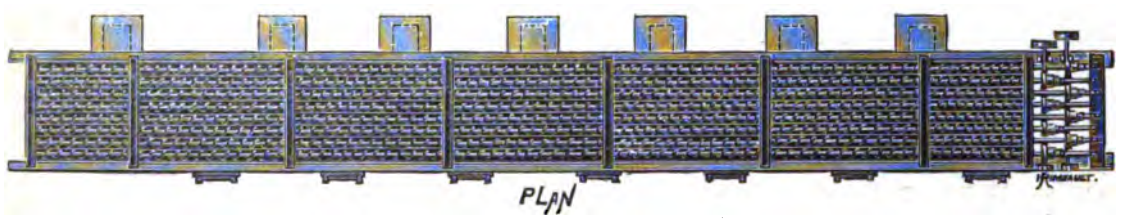

FIG. 3.

PATENT HORIZONTAL CONVEYOR DRYER

In the accompanying plan and elevation it will be seen that the revolving helices or blades are placed in parallel close together, over the source of heat, which may be either hot air, steam, or hot plates, as may be found convenient. The necessary revolving motion is conveyed by suitable gearing, with the result that we have a shallow layer of the material passing continuously at any desired speed over the heated area, and constantly and automatically delivered at the end.

When we bear in mind that these conveyor dryers are made in sizes from 10 to 200 feet long, we can readily see that an enormous quantity of material can be manipulated by this means, and that their field of application in the arts and manufactures is one of practically boundless extent.

CEMENTS OF RUBBER AND GUTTA-PERCHA.

IN making a cement one should know pretty thoroughly what is to expected of it before they could advise upon it. For instance, an ordinary rubber cement will hold on a host of different surfaces and with the best of success, except where there is continued dampness. For holding to damp walls, or surfaces where there is a constant pressure of moisture, there is nothing equal to Jeffry's marine glue, the formula for which has been published and republished all over the world. It consists of:—

1 part india-rubber,
12 parts coal tar,
2 parts asphaltum.

The rubber after having been massed is dissolved in the undistilled coal tar, and the asphaltum is then added. This glue, as its name indicates, is oftentimes used for mending articles at sea, or patches, for instance, that are to be laid on surfaces that are to be under water, and it has been found to be a most excellent thing. Of glass cements there are a great many, rubber as a rule being dissolved in some very volatile solvent and some hard drying gum is added.

A gutta-percha cement for leather is obtained by mixing the following. It is used hot. Gutta-percha, 100 parts; black pitch or asphaltum, 100 parts; oil of turpentine, 15 parts. An elastic gutta-percha cement especially useful for attaching the soles of boots and shoes, as on account of its great elasticity it is not liable to break or crack when bent. To make it adhere tightly the surface of the leather is slightly roughened. It is prepared as follows:—By dissolving 10 parts of gutta-percha in 100 parts of benzine. The clear solution from this is then poured into another bottle containing 100 parts of linseed oil varnish, and well shaken together.

Good rubber cement for sheet rubber, or for attaching rubber material of any description or shape to metal, may be made by softening and dissolving shellac in 10 times its weight of water of ammonia. A transparent mass is thus obtained, which, after keeping three or four weeks, becomes liquid, and may be used without requiring heat. When applied it will be found to soften the rubber, but when the ammonia is evaporated it forms a kind of hard coat, and causes it to become both impervious to gases as well as liquids.

Davy's universal cement is made by melting four parts of common pitch with four parts of gutta-percha in an iron vessel, and mixing well. It must be kept fluid, under water, or in a dry hard state.

A very adhesive cement, especially adapted for leather driving belts, is made by taking bisulphide of carbon 10 parts, oil of turpentine 1 part, and dissolving in this sufficient gutta-percha to form a paste. The manner of using this cement is to remove any grease that may be present in the leather by placing on the leather a piece of rag and then rubbing it over with a hot iron. The rag thus absorbs the grease, and

the two pieces are then roughened and the cement lightly spread on. The two pieces are then joined, and subjected till dry to a slight pressure.

A solution of gutta-percha for shoemakers is made by taking pieces of waste gutta-percha, first prepared by soaking in boiling water till soft. It is then cut into small pieces and placed in a vessel and covered with coal tar oil. It is then tightly corked to prevent evaporation, and allowed to stand for 24 hours. It is then melted by standing in hot water till perfectly fluid, and well stirred. Before using it must be warmed as before, by standing in hot water.

A cement for uniting india-rubber is composed as follows: 100 parts of finely chopped rubber, 15 parts of resin, 10 parts of shellac; these are dissolved in bisulphate of carbon.

Another india-rubber cement is made of: 15 grains of india-rubber, 2 ounces of chloroform, 4 drachms of mastic; first mix the india-rubber and chloroform together, and when dissolved the mastic is added in powder. It is then allowed to stand by for a week or two before using.

Cement for sticking on leather patches and for attaching rubber soles to boots and shoes is prepared from virgin or native india-rubber, by cutting it into small pieces or else shredding it up; a bottle is filled with this to about one-tenth of its capacity; benzine is then poured on till about three parts full, but be certain that the benzine is free from oil. It is then kept till thoroughly dissolved and of a thick consistency. If it turns out too thick or thin, suitable quantities must be added of either material to make as required.

An elastic cement is made by mixing together and allowing to dissolve the following: 4 ounces of bisulphide of carbon, 1 ounce of fine india-rubber, 2 drachms of isinglass, ½ ounce of gutta-percha. This cement is used for cementing leather and rubber, and when to be used the leather is roughened and a thin coat of the cement is applied. It is allowed to completely dry, then the two surfaces to be joined are warmed and then placed together and allowed to dry.

Cement used for repairing holes in rubber boots and shoes is made of the following solution: 1. Caoutchouc 10 parts, chloroform 280 parts. This is simply prepared by allowing the caoutchouc to dissolve in the chloroform. 2. Caoutchouc 10 parts, resin 4 parts, gum turpentine 40 parts. For this solution the caoutchouc is shaved into small pieces and melted up with the resin, the turpentine is then added, and all is then dissolved in the oil of turpentine. The two solutions are then mixed together to repair the shoe with this cement. First wash the hole over with it, then a piece of linen dipped in it is placed over it; as soon as the linen adheres to the sole, the cement is then applied as thickly as required.

NOTICE.

WE have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

October 7th.—"Manufacturing Smoke."
November 4th.—"Domestic Smoke."
December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the second Lecture, on November 4th—"Domestic Smoke"—the chair will be taken by Dr. A. Ransome, M.A., M.D., F.R.S., Lecturer on Hygiene at the Owen's College. The lecture will be illustrated by experiments.

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

Correspondence.

ANSWERS TO CORRESPONDENTS.

B.G.—Get a filter pump.
J.P.—"The Elements of Thermal Chemistry," by Muir and Wilson, Macmillan and Co., will perhaps suit you; or "Thermochemische Untersuchungen" by Thomsen.
Gramme.—About five volts.
M.H.—The spectroscope has no technical applications of importance. We doubt if it is now much used in connection with the Bessemer process.
Stannous.—Three preparations: Tin crystals, oxymuriate of tin, and muriate of tin. We do not understand your query about logwood.
J.K.P.—You have only to look through the publishers' catalogues to find that there are plenty of translations of German chemical books, good, bad, and indifferent.
Student.—(a) Only in presence of acetic acid and acetate of soda. (b) add hyposulphite of soda to the boiling solution.
G.H.T.—Yours is not the first complaint we have heard; other works' chemists have given utterance to strong language in denunciation of the class of men who, being backed by some capital, work (?) for low salaries, merely for pocket money; but while employers will take them what can you do?
Erratum.—In the letter "Covering Steam Pipes and Wood Distilling" in our last issue, line 12, the word "staving" should be "stewing." Our correspondent adds that the retorts are made of thick iron plates lined inside with bricks. Ed.

**We do not hold ourselves responsible for the opinions expressed by our correspondents.*

CAUSTICISING OF RECOVERED ASH.

(To the Editor of the Chemical Trade Journal.)

Dear Sir,—In connection with the causticising of recovered ash, I have noticed an interesting reaction. Curious enough, I have never noticed it while carrying out the operation on the large scale; but in the laboratory with liquors of 30° to 40° Tw., and while the lime mud was settling, I have seen a considerable evolution of gas take place. This gas seemed on testing to be hydrogen, and I am at a loss to account for its formation. Owing to the spasmodic and uncertain manner in which the gas was evolved, I have been unable to confirm my suspicions as to its nature.

If any of your readers have noticed the above, perhaps they will inform me whether this is a common or a rare occurrence, and also, if possible, the reaction which takes place.—I am, Sir, yours truly,

October 22, 1890. W. Y.

New Dyestuffs.—When dimethylaniline is first converted into nitrosodimethylaniline and this is then leucolised by means of zinc and finally oxidised, a basic body is obtained having the formula $2C_6H_4N_4CH_8$ which is not freely soluble in water, but is so in alcohol or ether, with a red colour. This is the base of a dark blue basic colouring matter capable of giving, on mordanted cotton, blue shades which are tolerably fast, while if the cotton be mordanted with tannin and iron a deep black can be obtained. A grey violet colouring matter is obtained as a by-product of the reaction, which will work on unmordanted as well as mordanted cotton. These new products have been recently patented by Mr. John Dawson, of Kirkheaton.

Market Reports.

THE TYNE CHEMICAL REPORT.

Tuesday.

There is practically no change to report in the price of chemicals this week. Business on the whole is steady, but transactions at the moment are not very numerous. Union prices come into force on the first November, and several sales of bleaching powder have been made at £6. 5s. per ton over 1891.

Most of the makers here have now contracted for their consumption of burnt lime for bleaching powder purposes, over next year, at prices equal to an advance of about ten per cent. on present rates.

The Newcastle Chemical Works Company, Limited, have issued a circular to their shareholders stating that the directors have, for some time past, been engaged in negotiations for the sale of the chemical and salt works, property and business, to a proposed new company, having for its object the union of the various Leblanc chemical manufacturers in the United Kingdom. The price which is proposed to be accepted is such as will, after discharging the mortgage and debenture debt and other liabilities of the company, be sufficient to repay, at least, to the

shareholders, in cash, the nominal paid up amount of the shares, viz.:—£1. per preference, and £4. per ordinary share. It is anticipated that they will obtain a price exceeding the amount indicated, and before entering into an agreement for the sale of the property, the directors desire to have the concurrence of the shareholders. In the event of the new company being successfully floated, meetings of the shareholders will be convened for the purpose of adopting the necessary resolutions providing for the voluntary winding up of the company.

To-day's prices for this month's delivery, are as follows:—Bleaching powder, in softwood casks, £5. 7s. 6d. to £5. 10s. per ton; in hardwood casks, 5s. per ton extra. Caustic soda, 77%, solid, in drums, £12. 5s. per ton; ground and packed in 3-4 cwt. barrels, £15. 5s. per ton. Soda ash, 48/52%, 1⅛d. per degree less 7½%; soda crystals, 56s. per ton; sulphate of soda, in bulk, 35s. per ton; ground and packed in casks, 45s. per ton; recovered sulphur, £4. 10s. per ton; chlorate of potash, 5½d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

The stoppage in the Scotch iron trade is affecting the coal market here, and prices of small coals for manufacturing purposes, particularly Northumberland, are again easier. Durham small is quoted from 6s. 6d. to 7s. 6d. per ton, and Northumberland steam small, from 6s. 3d. to 6s. 9d. per ton, according to quality.

TAR AND AMMONIA PRODUCTS.

Benzol is still rising; 4s. 7½d. has been paid for 90's, and 3s. 6d. for 50/90's. Higher prices are now spoken of all round. Anthracene is quieter. There are, however, no stocks worth speaking of in this country, so that we may look forward to a steady market. Prices are 1s. 6d. for 30% A and 1s. 2d. for 30% B. The demand for good solvent naphtha still continues, and creosote is passing away at exceedingly remunerative rates for the tar distiller. All other tar products remain in much the same condition as have already been reported.

Sulphate of ammonia is rather quieter, but there is no alteration in prices worth talking about, and if lower prices have been accepted in any instance, quality has had something to do with it. The Hull market may be quoted as £11. 10s. at least, several parcels of good quality having fetched more than this. At Leith, the price is £11. 10s., but buyers are attempting to make purchasers at £11. 8s. 9d., though we have not heard with what success. Beckton still keeps up its price at £11. 12s. 6d., and outside London makes have to be paid for at the same rate. There is a very good French demand still on, and the New York business from Liverpool is still good.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron rather dull; Scotch warrants closed at 50s. 1d. cash, and 50s. 5d. one month. Middlesbrough, 47s. cash; hematite, 56s. 9d., cash. Copper dull. Chili bars, G.O.B.'s and G.M.B.'s closed at £58. 2s. 6d. to £58. 10s. cash, and £58. 10s. to £58. 17s. 6d. three months. Tin a shade firmer: Straits closed at £98. to £98. 10s., and Straits, three months, £96. 10s. to £97. English ingots, £100. to £100. 10s. Lead: Spanish, £14. 2s. 6d. to £14. 5s.; English, £14. 10s. Spelter: Silesian, ordinary, £24. 10s. to £24. 12s. 6d. Quicksilver, £10. and £9. 18s. Copper shares: Rio Tinto, 25 to 25¼; Mason and Barry, 7 to 7¼; Libiola, 2⅛ to 2⅛; Panulcillo, 1⅛ to 1⅛; Tharsis, 5¾ to 6; Cape, 4⅛ to 5⅛; Copiapo, 2⅛ to 2⅛; Namaqua, 3 to 3⅛.

GLASGOW, WEDNESDAY.—Market easier, with small business. Scotch done at 50s. 1½d., 50s. 1d., and 50s. 1½d., cash, also at 50s. 4d. to 50s. 3d., and 50s. 4½d. one month; closing buyers at 50s. 1½d. cash, sellers ask ½d. more. Middlesbrough closes with buyers at 47s. cash, and 47s. 3d. one month; sellers ask 1½d. more. Hematite done at 56s. 9d. and 56s. 10d., cash, closing buyers at 56s. 9d. cash, and 57s., one month, sellers ask 1½d. more.

WOLVERHAMPTON, WEDNESDAY.—The Scotch blast furnacemen's dispute is still exercising an unsettling influence on local trade. The pig market this afternoon was quieter, and common and medium sorts were slightly lower on the week, cinder sorts being quoted 44s. 6d. and part mines 47s. 6d. Best qualities, however, were well maintained at 70s. upwards for hot blast all mine, and £5. for cold blast. Steel makers reported themselves very busy on bridge material for abroad. Steel bridge and tank plates were quoted £8.

MISCELLANEOUS CHEMICAL MARKET.

There is a firm market and good demand for alkalies. Soda ash steady at 1⅛ per deg. for prompt and forward. Caustic soda still maintains its position, so far as price is concerned, and values for spot and early delivery are 74% £12. 15s.; 70% £11. 10s., 60% £10. 10s., and cream 60% £10. per ton, all f.o.b., Liverpool. Bleaching powder has recovered its position, and is now held by makers for £5. 15s. to £6. at works for early deliveries within the present year. For 1891 delivery, the prices are firmer, and quotations are now £6. 5s. to £6. 10s. at makers' works. Chlorate of potash, steady, 5½d. per lb. Muriatic acid still held for 9d. and 10d. per carboy for 1891 deliveries, and some business has been done, but only to a limited extent. Sulphur is well sold for early and forward delivery, price firmer at £4. 2s. 6d. to £4. 5s. at makers' works. Vitriol still scarce. Sulphate of copper is lifeless and under pressure of some sellers, price for early delivery is rather lower at £18. 15s. to £19. Brown acetate of lime continues firm for spot and forward delivery at £7. 5s. and £7. 15s. respectively; grey, quiet at £12. 15s. to £13. per ton. Acetate of soda, £17. 10s. per ton, c.i.f. German makers of sugar of lead have again broken up their convention with decline in price as a consequence, notwithstanding higher value of raw materials. Nitrate of lead, stagnant at £21. 5s. to £21. 10s. Good business is still being done in potash carbonate and caustic, and the prices are firmly maintained. Some considerable business has been done over 1891 at present values. Prussiate of potash, steady at 10d. per lb. with good inquiry.

It is expected that the prospectus of the Chemical Union will be in the hands of the public very shortly. The practicability of this large scheme and its consummation has never passed beyond the probability of failure.

REPORT ON MANURE MATERIAL.

The market throughout the week has been very flat, with very little doing either in nitrogenous or phosphatic manure material.

Mineral phosphates are the turn easier. Nominally prices remain the same, but sellers seem more anxious to be getting on, and to effect sales they would have to make concessions in prices.

Bones and bone meal are decidedly easier all round, and £5. 10s. could not now be obtained for cargoes of River Plate bones. Some very fine Bombay meal has been sold at £5. 17s. 6d., ex quay, but this is exceptional, and the nearest value for shipment is £5. 12s. 6d., delivered ex quay Liverpool. £5. 7s. 6d. would probably have to be accepted for crushed East Indian bones in order to induce business. Common grinding bones cannot be valued at over £4. 17s. 6d. to £5s. per ton, ex quay Liverpool.

There is less inquiry for River Plate bone ash, and £5. 7s. 6d. on 70%, nett, Hamburg conditions, delivered U.K. or Continent, not now obtainable.

Nitrate of soda has experienced a further decline. Spot value is 8s. 4½d. per cwt. for ordinary quality; 8s. 6d. for refined. Due cargoes are not worth over 8s. 4½d. per cwt., and it is doubtful whether 8s. 7½d. could be got for guaranteed November shipment. Later shipments may be had at still less money.

Some further transactions have taken place in home-prepared dried blood, but prices are not reported.

Superphosphates are very firm, the makers' stocks having been kept low by deliveries against large export contracts.

THE COPPER MARKET.

Messrs. Harrington and Co., in their copper report, dated October 16th, state:—Chili copper charters for first half of October are advised as 1,000 tons. Price of bars 24·05 dols., and Exchange 24d. The total charters since 1st January are 20,400 tons, against 17,400 tons for the same time last year. During the past fortnight copper has been on the decline, owing to disturbances on the Stock Exchange, which caused fear of dearer money, and from £59. 7s. 6d. cash, and £59. 17s. 6d. three months, we touched £57. 7s. 6d. and £57. 17s. 6d. respectively. Yesterday and to-day prices improved £58. 10s. and £59. respectively, and we close steady at £58. 12s. 6d. cash, and £59. 2s. 6d. three months. The decrease in the Liverpool, Swansea, London, and Havre stocks for the fortnight is 1,413 tons. The present stock of English g.m.b.'s in warehouse, owing to 340 tons being returned into Swansea stock, and the deliveries in both Swansea and Liverpool only amounting to 131 tons, shows an increase for the fortnight of 209 tons, making the stock 3,841 tons, against 3,632 tons on 30th ult. On the 13th instant the MacMillan arrived at Swansea from Santa Rosalia, with a cargo of Boleo bars and Matte already reported in ours of the 2nd September. Refined and manu-

factured sorts are quiet at £63. to £64. for tough, £67. to £67. 10s. for best selected, £67. to £68. for India sheets, £71. to £72. for strong sheets, and 6⅜d. to 6½d. for yellow metal sheets. The sales of furnace material comprise at Liverpool — 93 tons Spanish ore at 10s. 6d. ; 38 tons Barancannes copper ore at 11s. 3d. ; 25 tons English precipitate, on private terms ; 15 tons Libiola precipitate at 12s. ; 500 tons Boston Montana Matte, to arrive at 11s. 6d. ; 9 tons Peruvian ore at 11s. ; 77 tons Penaflor Spanish ore (15%), to arrive, at 10s. 10½d. ; and 42 tons Penaflor Spanish ore (6%), also to arrive, at 9s. 6d. per unit. At Swansea—700 to 800 tons Seville ore (6 to 8% copper, but very rich in sulphur), to arrive, at 11s. 7½d. ; 147 tons Mason's precipitate (out of old syndicate stock), various low produces, at 9s. 3d. to 10s. 3d. ; 100 tons Quebrada regulus at 11s. 6d. ; 1,575 tons Quebrada regulus at 11s. 4½d. ; 100 tons Tilt Cove regulus (10%), at 10s. 3d. ; and 84 tons Tilt Cove ore (8 to 15%), at 10s. 3d. per unit.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Caustic soda values seem now on the move backwards, although the drop as yet is not much to speak of. Chlorate of potash also is rather easier, and nitrate of soda is very quiet at not more than 8s. 6d. Bicarbonate of soda is dearer, making about the only instance of a positive rise for the week. Sulphate of ammonia cannot be quoted now at higher than the figure of last week, namely, £11. 10s f.o.b. Leith, but it is on not quite fully authenticated report that at the end of the week £11. 11s. 3d. was got. To-day the sulphate market is far from active, and no more than £11. 10s. is obtainable. In the paraffin section firmness continues (with the now stereotyped exception of burning oil), and although in 885° lubricating there is somewhat of a glut of stocks with a slight recession, the other gravities are very well held. Renewed rumour yesterday of a big Scotch oil syndicate is believed to have no stronger basis than Stock Exchange manipulation, but it has succeeded so far as to send oil shares up a little for the day, these having been rather flat of late. Bichromates have been moving off moderately for English delivery and export, but the Scotch demand is very weak. Bleach is rather firmer. Chief prices current are : Soda crystals, 56s. 6d. net Tyne ; alum in lump £5. 2s. 6d., net Glasgow ; soda ash, 1⅜d. less 7½%, Tyne ; caustic soda, white, 76°, £13. 5s., 70/72°, £11. 7s. 6d., 60/62°, £10. 10s., and cream, 60/62°, £9. 15s., all less 2½% Liverpool ; bicarbonate of soda, 5 cwt. casks, £6. 15s., and 1 cwt. casks, £7. 5s., net Tyne ; refined alkali, 48/52°, 1⅝d., less 2½% Tyne ; saltcake, 40s. ; borax, English refined, £30., and boracic acid, £37. 10s., net Glasgow ; bleaching powder, £5. 15s. to £6. less 5% f.o.r. Glasgow ; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow ; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow ; chlorate of potash, 5¼d., less 5% any port ; nitrate of soda 8s. 6d. ; sulphate of ammonia, £11. 10s. f.o.b. Leith ; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port ; sulphate of copper, £19., less 5% Liverpool ; paraffin scale, hard and soft, 2¾d. per lb ; paraffin wax, 120°, semi-refined, 3⅝d. ; paraffin spirit (naphtha,) 8d. a gallon ; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 15s. ; 885°, £6. to £6. 10s. ; and 890/895°, £7. 5s. to £7. 15s. Week's imports of sugar at Greenock were 2,106 bags.

THE LIVERPOOL MINERAL MARKET.

Duing the week a brisk business has been done at full prices. Manganese : Arrivals somewhat improved. Whilst they have gone direct into consumption stocks have been further drawn upon, and prices, therefore, are firmer. Magnesite : Stocks still excessively large, and prices in hands of buyers. Raw lump, 30s. to 40s. ; raw ground, £6. 10s., and calcined ground £11. Bauxite (Irish Hill brand) is in unexceptional demand, and prices are strong at—lump, 22s. ; seconds, 18s. ; thirds, 14s. ; ground, 35s. French chalk : Although arrivals are somewhat larger on account of the demand, they have all gone into consumption, and prices continue firm, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes : Carbonate easier, whilst sulphate is scarce, especially "Angel White." Pumicestone unaltered : ground at £10., and specially selected lump, finest quality £13. Iron ore continues easy. Spanish and manganiferous steady ; Bilbao and Santander, 9s. to 10s. 6d. f.o.b. ; Irish, 11s. to 12s. 6d. ; Cumberland, 9s. to 10s. 6d. Purple ore steady. Emerystone : Best brands very scarce, prices stronger. No. 1 lump £5. 10s. to £6., and smalls £5. to £5. 10s. Fullers' earth : 45s. to 50s. for best blue and yellow ; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal continue to be more asked for at advanced figures. Chrome ore : Improved inquiry, whilst stocks, except at manufacturers' works, are nil. Antimony ore and metal in demand at full figures. Asbestos in strong demand, especially Canadian rock, which brings full prices. Potter's lead ore of best and "standard" brands in request ; smalls, £14. to £15. ; selected lump, £16. to £17. Calamine : Good qualities in demand at top prices. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16. ; powdered (manufactured), £11. to £12. Limespar : English manufactured, old G.G.B. brand in request at 50s. (gtound). Felspar and fluorspar, steadier. Plumbago : Spanish, £6. ; best Ceylon lump at last quotations ; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6. ; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay, more doing—common, 18s. 6d. ; good medium, 22s. 6d. to 25s. ; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), firm, finest quality, 22s.

THE LIVERPOOL COLOUR MARKET.

Colours remain steady, without alteration in prices. Ochres : Oxfordshire, common, £10., medium, £12., best, £15. ; Derbyshire, common, 40s , medium, 50s., best 60s. ; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s. ; Irish, Devonshire, 40s. to 45s. ; French, J.C., 55s., 45s., to 60s. ; M.C., 65s. to 67s. 6d. ; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt : Prepared oxide, 10s. 6d. ; black, 9s. 9d. ; blue, 6s. 6d. Zaffres : No. 1, 3s. 6d. ; No. 2, 2s. 6d. Oxide of iron : Good inquiry ; common, £6. ; medium, £10. ; finest, £20.

New Companies.

Fish Guano, Limited.—This company was registered on the 13th inst., with a capital of £1,000., in £5., shares, to manufacture and deal in guano, or manure, oil, glue, and other products, wholly or partly composed of fish, fish skins, fish refuse, or offal. The subscribers are :—

	Shares.
J. Phillips, Milford Haven, shipping agent	1
Mrs. Phillips, Milford Haven	1
H. D. C. Grace, 111, Shooter's-hill-road, S.E.	1
H. L. Ward, 65, Romford-road, Stratford	1
W. L. Millachip, 7, Cavendish-road, Brondesbury	1
J. Bowcher, 195, Brecknock-road, N., clerk	1
A. Lowe, Sidcup, stationer	1

Stanghow Ironstone Company, Limited.—This company was registered on the 9th inst , with a capital of £100,000., in £10., shares, to acquire and work ironstone, or other mines, and for such purposes to adopt an unregistered agreement betwecn C. F. H. Balckow and Alfred C. Downey. The subscribers are :—

	Shares.
A. C. Downey, Middlesbro', ironmaster	1
C. F. H. Bolckow, Middlesbro', ironmaster	1
H. W. F. Bolckow, Middlesbro', ironmaster	1
J. Lewis, Middlesbro', accountant	1
W. Anderson, Coatham, Redcar, work's manager	1
J. Fidler, Coatham, Redcar, accountant	1
T. A. Craig, Middlesbro', accountant	1

William Harrison, Limited.—This company was registered on the 11th inst., with a capital of £100,000., in £10. shares, 3,000 of which are 5 per cent. cumulative preference shares, to acquire the Brownhill Collieries, together with the veins or seams of coal, clay, and other minerals, in the parishes of Norton Canes, Bushbury, and Cannock, Staffordshire, heretofore belonging to and worked by the firm of William Harrison. The subscribers are :—

	Shares.
J. Harrison, Croydon, colliery proprietor	1
A. B. Harrison, Aldershaw, Lichfield, coal owner	1
C. Marshall, Walsall, tripe manufacturer	1
A. W. Hutton, Walsall, engineer	1
J. R. Holliday, 4, Bennett's-hill, Birmingham, solicitor	1
J. Holland, Brownhills, colliery agent	1
J. S. Williamson, Brownhills, colliery manager	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

Little and Dawkins, Slaughterford common brewers and maltsters.
M. and F. Grist, Merrett's Mills, near Nailsworth, flock and shoddy manufacturers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

Rowbotham, Walter (trading as W. Rowbotham and Co), Salford, Lancashire, electrical engineers.

Adjudications.

Jones, George Owen, Newcastle-on-Tyne, electrician.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Sizing and Breaking Coke. W. H. Baxter. 15,756. October 6.
Water Filter and Pump. J. Dixon and J. Skirrow. 15,757. October 6.
Apparatus for Discharging Disinfectants. C. Symes. 15,771. October 6.
Electric Meters. B. J. B. Mills. 15,777. October 6.
Separating Orthotoluol-sulphonic and Paratoluol-sulphonic Acids. M. Lange. 15,778. October 6.
Maturing Wine. E. R. Budden. 15,790. October 6.
Filters. H. H. Lake. 15,794. October 6.
Improvements in Tubular Steam Boilers. E. Petersen. 15,797. October 6.
New Napthaline Derivative. J. Y. Johnson. 15,803. October 6.
Aerating Liquids. J. M. Mc Donald. 15,805. October 6.
Treatment of Metallic Ores. A. J. Campion and J. E. Tenison-Woods. 15,806. October 6.
Dynamos. J. Johnstone. 15,819. October 7.
do. W. F. King. 15,828. October 7.
Reduction of Ores. J. T. King. 15,830. October 7.
Fluid for Tempering Steel.—(Complete Specification). E. Tweedy. 15,833. October 7.
Manufacture of Manganese Bricks, and Recovery of Sulphate of Potash from Ferro-manganese, "flue-dust." J. Hofmann. 15,838. October 7.
Refining Linseed Oil. C. Morfit. 15,847. October 7.
Softening Refractory Ores.—(Complete Specification). J. Hopper. 15,859. October 7.
Obtaining Fine Spirits of Wine. B. Dukes. 15,881. October 7.
Feed Water Heaters. J. Atkinson. 15,894. October 7.
Improved Varnish. H. H. Lake. 15,899. October 7.
Cellular Non-conducting Blocks.—(Complete Specification.) L. Sterne. 15,900. October 7.
Manufacture of Carbonate of Lead. N. K. Morris. 15,903. October 7.
Apparatus for Delivering Measured Quantities of Liquids. C. W. Corbett. 15,916. October 8.
Lining Paper Pulp Digesters. C. Kellner. 15,930. October 8.
" " C. Kellner. 15,931. October 8.
Raising Liquids with Compressed Air. A. Bruce. 15,941. October 8.
Manufacture of Vinegar. J. A. Nettleton. 15,942. October 8.
Feed Water Heaters. J. Wood. 15,949. October 8.
Washing Frames for Metallic Sludge. A. Ark. 15,959. October 8.
Apparatus for Delivering Measured Quantities of Liquids. A. J. Postans. 15,989. October 8.
Carburetting Air. G. Petit and E. Blanc. 15,990 October 8.
Apparatus for Boiling Wood Pulp.—(Complete Specification.) F. V. L. Hiorth. 15,995. October 8.
Manufacture of Oxygen. J. C. Lawson. 15,998. October 9.
Water Softening Apparatus.—(Complete Specification). R. S. Brownlow. 16,006. October 9.
Smoke Consumer and Feed Water Heater. J. Illingworth. 16,015. October 9.
Waterproofing Skins.—(Complete Specification). W. Dyshko. 16,017. Oct. 9.
Protecting Iron Surfaces from Corrosion. J. Robson. 16,023. October 9.
Grease Extracting Apparatus. W. H. Lever, J. D. Lever, and E. G. Scott. 16,025. October 9.
Insulating and Fire Resisting Composition. J. Trecziok. 16,034. Oct. 9.
Manufacture of Cyanides of Ammonia.—(Complete Specification). R Haddan. 16,049. October 9.
Electric Batteries. H. G. C. Serrin. 16,054. October 9.
Do. do. do. 16,055. October 9.
Manufacture of Soap.—(Complete Specification). C. A. O. Rosell and J. C. Pennie. 16,059 October 9.
Obtaining Metallic Sodium.—(Complete Specification). L. Grabau. 16,060. October 9.
Secondary Batteries.—(Complete Specification). J. K. Pumpelly and F. Butterworth. 16,064. October 10.
Production of White Lead.—(Complete Specification). R. W. E. MacIvor and W. Smith. 16,093. October 10.
Filters. J. Haslam. 16,094. October 10.
Protecting Iron and other Surfaces from Corrosion. J. O. Day. 16,107. October 10.
Smoke Consumption. L. E. Chagniat, J. Sparrow, and G. J. J. Legrand. 16,111. October 10.
Fire Kiln for China, etc. J. W. Payne 16,131. October 11.
Carburetting Apparatus. J. H. Hilton. 16,167. October 11.
Steam Generators. J. I. Thornycroft. 16,183. October 11.
Explosives. H. H. Lake. 16,189 October 11.
Filter and Oil Compressors. A. Estrayer. 16,192. October 11.
Heating Air and Consuming Smoke. W. Wheatley, director for and on behalf of the Smoke Prevention Co., Ltd.
Regenerative Gas Furnaces. F. Siemens 16,207. October 11.
Charging Inclined Gas Retorts A Coze. 16,213. October 11.
Manufacture of Hydrated Oxide of Iron. M. Netto. 16,218. October 11.
Electric Meters. A. Reckenzaun. 16,221. October 11.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 11th.

Antimony Ore—

Japan,	50 t.	Coml. Lighterage Co.
France,	56	L. & I. D. Jt. Co.
"	20	H. R. Merton & Co.
Japan,	19	Pillow, Jones & Co.
Portugal,	25	H. Emanuel

Antimony—

France,	4 t.	Allatini Bros.

Ammonia—

Belgium,	£60	Weatherley, Mead & Co.
"	60	"

Acetate Amyl—

Germany,	24 pks.	F. Stahlschmidt & Co.

Acetic Acid—

Holland,	68 pks.	Phillipps & Graves
"	50	Beresford & Co.

Barytes—

Germany,	20 cks.	J. Dickinson & Co. Ltd,
Belgium,	23 pks.	O'Hara & Hoa.
"	86	W. Harrison & Cor
Germany,	23 cks.	D. Storer & Sons. Ltd,

Borax—

Germany,	70 drs.	A. & M. Zimmermann.

Barytes Nitrate—

Germany,	£50.	H. Lambert

Boracic Acid—

Italy,	35 pks.	Howards & Son

Brimstone—

Italy,	40 t.	Union Lighterage Co.

Bones—

E. Indies,	123 t.	Gonne, Croft & Co.
U. S.	31	H. A. Lane & Co.
Robat,	20	G. Crusoe & Co.
Germany,	15	J. Scott.

Copper Ore—

U. S.	30 t.	R.M S.P. Co.
Spain,	30 c.	L. Lazarus & Sons, Ld.

Copperas—

Germany,	£28.	B. & N. Wfs. Co., Ld.

Copper Sulphate—

Germany,	60 drs.	Charles & Fox
"	£44.	"

Caustic Potash—

France,	2 drs.	Petri Bros.

Cream of Tartar—

Holland,	19 pks.	Carey & Sons
France,	1	B. & F. Wf. Co., Ld.
Italy,	20	"
Spain,	6	F. Smith

Caoutchouc—

Madagascar,	56 c.	W. M. Smith & Sons.
"	50	Prop. Bull Wf.
France,	161	A. Grey & Co.
Zanzibar,	341	L. & I. D. Jt. Co.
"	100	Anderson, Weber & Smith
"	42	Lewis & Reat
"	47	Arnold Cheney & Co.
"	65	Clark & Smith
"	275	L. & I. D. Jt. Co.
Portugal,	407	N. S. S. Co., Ld.
"	15	L. & I. D. Jt. Co.
Inhambane,	12	"
France,	9	Prop. Bull Wf.
Zanzibar,	188	Wallace Bros.
U. S.	36	W. Pope & Co.
Zanzibar,	137	L. & I. D. Jt. Co.
Mozambique,	14	"
Singapore,	14	R. & J. Henderson

Caustic Soda—

Belgium,	119 c.	Beresford & Co.
Holland,	14 cks.	"

Chemicals *(otherwise undescribed)*

Germany,	£12	T. H. Lee
"	78	Craven & Co.
"	22	H. Lambert
Holland,	35	Beresford & Co.
"	81	R. Morrison & Co.
"	9	Phillipps & Graves
France,	20	G. N. Ry. Co.
Germany,	62	Spies Bros. & Co.
"	15	T. H. Lee
France,	11	Seaward Bros.
"	12	"
Germany,	34	T. H. Lee
"	135	A. & M. Zimmermann

Dyestuffs—

Annatto

E. Indies,	8 pks.	Hoare, Wilson & Co.

Cochineal

Canaries,	27 pks.	L. & I. D. Jt. Co.
Teneriffe,	27	Shaw, Savill & Albion Co., Ld.

Sandal

E. Indies,	10 t.	Walker, Munsie & Co.

Redwood

E. Indies,	10 t.	L. & I. D. Jt. Co.

Sapan

E. Indies,	23 t.	L. & I. D. Jt. Co.

Myrabolams

E. Indies	137 pks.	J. P. Alpe & Co.
"	487	Hoare, Wilson & Co.
"	137	Cayzer Irvine & Co.
"	137	L. & I. D. Jt. Co.

Indigo

Holland,	3 chts.	T. H. Lee
France,	5	L. & I. D. Jt Co.
E. Indies,	8	J. Owen
"	10	L. & I. D. Jt. Co.
"	5	W. Brandt Sons & Co.
"	34	Elkan & Co.
Cape,	2	L. & I. D. jt. Co.
E. Indies.	28	"
"	20	Arbuthnot, Latham & Co.

Tanners' Bark

Melbourne,	10 c.	W. Shelcott
"	208 t	Elkan & Co.
"	82	Devitt & Hett
"	135	Baxter & Hoare
Belgium,	40	J. & J. Williamson & Sons

Gambier

Singapore,	210 pks.	L. & I. D. Jt. Co.
"	108	Beresford and Co.
"	100	L. & I. D. Jt Co.
"	166	P. & S. Evans & Co.
"	214	Ashmore & Son

Logwood

Belize,	25 t.	A. Everingham & Co.
Jamaica,	307	Anderson, Anderson & Co.
"	17	Park, Macfadyen & Co.
"	26	Gillespie Bros. & Co.
"	40	L. & I. D. Jt. Co.

Fustic

Jamaica,	26 t.	Anderson, Anderson & Co.
Belize,	40	A. Everingham & Co.
Jamaica,	10	Gillespie Bros. & Co.
"	14	Park, Macfadyen & Co.

Sumac

Italy,	150 pks.	C. E. Fosbroobe
"	40	Blundell Spence & Co.
"	100	Vokins & Co., Ld.
"	1,000	J. Kitchin, Ld.
"	100	H. Johnson & Sons
"	485	Beresford & Co.
"	754	W. Shelcott
"	300	W. France & Co.

Extracts

Holland,	49 pks.	Burt, Boulton & Co.
"	49	Little & Johnston
U. S.	350	T. Ronaldson & Co.

Argols

Italy,	341 pks.	B. Jacob & Sons

Glucose—
Germany, 4 pks. 26 cwts. T. H. Lee
,, 200 200 M. D. Co.
,, 47 368 L. Sutro & Co.
,, 100 100 Botolph & Nich's Whvs. Co., Ld.
,, 38 160 Baxter & Hoare
,, 200 200 Howell & Co.
,, 200 200 J. Barber & Co.
France, 220 220 Barrett, Tagant & Co.
Holland, 29 232 L. Suto & Co.
Germany, 600 600 J. Barber & Co.
,, 25 210 J. Knill & Co.
,, 5 40 Dutrulle, Soloman & Co.
U. States, 120 600 T. M. Duche & Sons
,, 40 220 Barrett, Tagant & Co.
Germany, 5 40 Perkins & Homer
U. States, 100 564 J. Keiller & Son
,, 400 402 Lichtenstein & Co.
,, 500 500 Barrett, Tagant & Co.
Germany, 300 300 Trier, Meyer & Co.
,, 31 258 Pillow, Jones & Co.

Gutta Percha—
Singapore, 201 c. Soundy & Son
,, 200 Kleinwort, Sons & Co.
Holland, 259 Robinson, Roberts & Co.
Singapore, 3 R. & J. Henderson
,, 79 Kleinwort, Sons & Co.
,, 497 Kaltenbach & Schmitz

Glycerine—
Holland, 32 pks. G. Rahn & Co.
Germany, 63 T. H. Lee
,, 60 drs. Beresford & Co.
Holland, £110 G. Rahn & Co.
Germany, 30 Beresford & Co.

Isinglass—
N. Russia, 3 pks. J. Vicars
Penang, 7 L. & I. D. Jt. Co.
Germany, 1 J. Stutchbury & Sons
Singapore, 4 W. M. Smith & Sons
,, 4 Proprs., Bull Wf.
France, 7 Dunlop Bros.
E. Indies, 5 Clarke & Smith

Iron Bromide—
Germany, £650 A. & M. Zimmermann
Italy, 300 ,,

Manure—
St. Valery, 215 t. A. Hunter & Co.
E. Indies, 25 D. de Pass & Co.
Belgium, 180 Schofield, White & Co.
France, 230 A. Hunter & Co.
Germany, 50 F. W. Berk & Co.
U. States, 4 C. A. & H. Nichols
Belgium, 125 Odam's Chem. Man. Co.
Germany, 20 S. F. Waters & Co.

Naphtha—
Germany, 16 drs. Stein Bros.
Belgium, 14 ,,

Pyrites—
Spain, 350 t. F. C. Hills & Co.
Pomaron, 970 Mason & Barry

Plumbago—
E. Indies, 82 brls. Thredder, Son & Co.
,, 75 cks. Prop. Sun. Whf.
,, 110 Beresford & Co.
,, 264 Prop., Chmblns Wf.
Holland, 171 Brown & Elmslie
,, 191 ,,
E. Indies, 387 Thredder, Son Co.
,, 81 Prop., Chmbler's Wf.
,, 47 brls. J. Owen

Pitch—
Germany, 52 brls. C. B. Leighton

Paraffin Wax—
U. States, 2,470 brls. J. H. Usmar & Co.
,, 557 115 cs. H. Hill & Sons

Potassium Sulphate—
France, 21 pks. Beresford & Co.

Potassium Permanganate—
Germany, £65. Vogt & Co.
,, 20 H. Lorenz

Potashes—
Montreal, 65 c. Charles & Fox
Holland, 26 pks. Thames S. T. Co.
France, 12 Beresford & Co.

Stearine—
Belgium, 65 bgs. H. Hill & Sons
France, 200 G. Boor & Co.

Stearine—*continued.*
,, 109 sks. Beresford & Co.
,, 50 cks. W. Balchin
,, 200 bgs. G. Boor & Co.
Holland, 64 H. Hill & Sons

Saltpetre—
Germany, 84 cks. J. Hall & Son
E. Indies, 340 bgs. L. & I. D. Jt. Co.
,, 164 cks. Ralli Bros.
,, 1,098 Lucas and Spencer
,, 279 C. Wimble & Co.
Germany, 100 Merry & Son

Sodium Hypophosphate
Germany, £55. Beresford & Co.

Sodium Acetate—
Germany, 25 pks. Beresford & Co.

Soda—
Holland, 1,217 pks. D. A. Fisher

Tartar—
Italy, £850. Howards & Son
,, 1,220 Beresford & Co.

Tartaric Acid—
Holland, 12 pks. W. C. Bacon & Co.
France, 28 O. Andre & Co.

Turpentine—
Brunswick, 2,058 brls. Nickoll & Knight

Ultramarine—
Germany, 4 cks. G. Steinhoff
,, 3 Spies Bros. & Co.
Holland, 14 Ohlenschlajer Bros.
,, 5 cs. Phillipps & Graves
,, 5 Spies Bros. & Co.
Germany, 2 cks. H. Lambert
Holland, 4 pks Hernu, Peron & Co.
France, 20 cks. Seaward Bros.
U. States, 25 W. Isted

Verdigris—
France, 4 pks. Skilbeck Bros.

Zinc Oxide—
Germany, 45 cks. W. A. Rose & Co.
,, 50 W. C. Bames & Co.
Holland, 50 brls. G. Dards
,, 100 M. Ashby, Ltd.
,, 50 ,,
,, 27 Beresford & Co.
Germany, 2 cks. Gerard Bros. & Co.
Holland, 200 brls. M. Ashby, Ltd.

LIVERPOOL.

Week ending Oct. 14th.

Acetic Acid—
Rotterdam, 10 bskts.

Alcohol—
Hamburg, 12 hds.

Borax—
Hamburg, 10 cks.

Caoutchouc—
Accra, 11 brls. Hutton & Co.
,, 16 Fischer & Co.
,, 11 J. P. Werner
,, 4 F. & A. Swanzy
Salt Pond, 8 cs. 12 cks. Pickering & Berthoud
,, 9 23 Radcliffe & Durant
,, 2 10 Edwards Bros.
,, 4 2 Tomlinson & Co.
,, 1 2 W. D. Woodin
,, 3 S. & C. Nordlinger
,, 1 Davies, Robbins, & Co.
,, 3 23 Miller Bros.
,, 1 2 F. A. Swanzy
,, 8 Griffiths & Co.
,, 1 6 A Reis
,, 5 C. Rottmann
Addah, 24 J. P. Werner
,, 4 F. A. Swanzy
Grand Bassa, 1 cs. French & Co.
Sierra Leone, 12 brls. Pickering & Berthoud
,, 4 Paterson, Zachonis, & Co.
,, 32 French & Co.
Bathurst, 25 cks. A. Reis
,, 2
Goree, 8 Cros & Co.
Constantinople, 23 bgs.
Lisbon, 30
Boston, 23 cs. T. Turner

Copper Ore—
Valparaiso, 41 sks.
,, 342 Bk. of Tarapaca
,, 612 Hainsworth, Watson, & Co.
Marseilles, 712 bgs.
Montreal, 320
Lisbon, 28 brls. 92 t. Harrington & Co.
Montreal, 207 R. Carter & Co.

Cream of Tartar—
Barcelona, 2 cks.
Tarragona, 5
Bordeaux, 1
Patras, 13 brls. M. D. Frangopulo

Dyestuffs—
Madders
Smyrna, 23 brls.
Logwood
Huaymie, 245 t. E. Brownbill & Co.
Valonia
Smyrna, 190 t.
Syra, 202 bgs. Androulis Bros.
Smyrna, 337 M. J. Saul & Co.
Patras, 120
Fustic
Maracaibo, 70 t.
Divi Divi
Maracaibo, 201 t.
Yellow Berries
Smyrna, 4 bgs. M. J. Saul & Co.
Dyestuffs *(otherwise undescribed)*
Hamburg, a quantity.

Dried Blood—
Monte Video, 377 bgs. J. Purdon

Glucose—
Hamburg, 40 cks.
,, 76

Glycerine—
Rotterdam, 15 crbys. 20 cs.
Hamburg, 5 5
Bordeaux, 17 cks.

Horn Piths—
Mogdalina, 37,255

Iodine—
Valparaiso, 99 brls. A. Gibbs & Sons
,, 52 W. & J. Lockett

Isinglass—
Maranham, 7 cks. Gunston, Sons. & Co.
,, 3 H. Rogers, Sons, & Co.
,, 1 T. J. Taylor
,, 1 Schill, Medera, & Co.
,, 2 cs. Bieber & Co.

Magnesia—
Rotterdam, 6 cs.

Manganese Sulphate—
Hamburg, 2 cks.

Potash—
Hamburg, 20 kgs.

Pitch—
Amsterdam, 74 cks.
Dunkirk, 29

Pyrites—
Huelva, 1,370 t. Matheson & Co.

Phosphate—
Montreal, 190 t. Miller & Co.
,, 140 Pickford & Winkfield
,, 75 Andrew Hants

Sulphur Ore—
Huelva, 1,449 t. Matheson & Co.

Soapstone—
San Francisco, 90 cks. C. F. Smith

Soda—
Rotterdam, 15 cks.

Soap—
Boston, 4 cs. R. Hovenden & Co.
Marseilles, 5 J. Cowden
New York, 300 bxs. W. H. Fassett

Salammoniac—
Havre, 33 cks. Cunard S. S. Co. Ltd.

Saltpetre—
Hamburg, 100 kgs. 32 cks.

Tartar—
Bordeaux, 7 cks.
,, 35

Tar—
Uleaborg, 800 brls. 1,000½ brls. P. Houlgrave & Co.

Ultramarine—
Rotterdam, 15 cs.
,, 5 cks.

Zinc Ashes—
Marseilles, 30 brls.

GRIMSBY.

Week ending Oct. 11th.

Albumen—
Hamburg, 10 cks.

Chemicals *(otherwise undescribed)*
Hamburg, 5 cs. 41 cks.

Zinc Ashes—
Hamburg, 20 cks.

TYNE.

Week ending October 15th.

Barytes—
Rotterdam, 69 cks. Tyne S. S. Co.

Caustic Soda—
Antwerp, 1 cs. Tyne S. S. Co.

Glycerine—
Hamburg, 15 cs. Tyne S. S. Co.
,, 1 drm. ,,

Glucose—
Rotterdam, 40 bgs. Tyne S. S. Co.

Phosphate—
Antwerp, 220 t. Langdale's Chemical Manure Co.

Pyrites—
Huelva, 1,742 t. Scott Bros.

Precipitate—
Huelva, 314 t. Scott Bros.

Saltpetre—
Hamburg, 10 kgs. Tyne S. S. Co.

Sulphur Ore—
Drontheim, 200 t.

Zinc Ashes—
Christiania, 84 bgs.

Zinc Oxide—
Antwerp, 20 brls. Tyne S. S. Co.

GLASGOW.

Week ending October 16th.

Aluminium—
2 cs.

Acetic Acid—
Rotterdam, 20 balls Hutchinson & Son

Ammonia—
Rotterdam, 1 ck. J. Rankine & Son

Cobalt Ore—
Bombay, 4.198 bgs. The Nickel Wks.

Cream of Tartar—
Bombay, 15 brls.
Bilbao, 2 cks.

Dyestuffs—
Sumac
Bombay, 200 sks.
Logwood
Lagana, 55 t.
Jamaica, 9 1⅛ c.
,, 105 W. Cormal & Co.
,, 9¼ Wallace, Wilkie & Co.
Alizarine
Rotterdam, 139 cks. Hutchinson & Son
,, 39 W. & L. Ringrose
,, 126
Fustic
Jamaica, 121 t. 5¾ c.
,, 21 19¾
,, 6 8½
Rotterdam, 23 cks. 1 cs.
Jamaica, 99 t. 6¼ c. Wallace, Wilkie & Co.
Argols
Bordeaux, 48 bgs.
Extracts
Antwerp, 3 cks.

Glucose—
Bombay, 16 cks.
Hamburg, 10 Woodhouse & Co.
,, 3 Rawson & Robinson

Potassium Bichromate—
Rotterdam, 8 cks. J. Rankine & Son

Pitch—
Danzig, 23 pks.

Phosphate of Lime—
Antwerp, 2,000 bgs.

Saltpetre—
Hamburg, 2 brls.

Sulphur Ore—
Drontheim, 150 t.

Sulphur—
Bombay, 50 brls. 5 cs.

Turpentine—
Libau, 52 brls.

Tartar—
Bordeaux, 18 cks.

Ultramarine—
Rotterdam, 20 cs. Hutchinson & Son

Zinc Oxide—
Rotterdam, 50 cs. J. Rankine & Son

HULL.

Week ending Oct. 16th.

Alumina—
Rotterdam, 41 cks. W. & C. L. Ringrose

Acetic Acid—
Hamburg, 1 ck. Furley & Co.

Barytes—
Bremen, 23 cks. Tudor & Sons
Antwerp, 40 Bailey & Leetham
" 61
Bremen, 21 J. W. Davis & Son
" 61

Chemicals *(otherwise undescribed)*
Bremen, 17 crbys. Veltman & Co.
Bari, 14 cks. Wilson Sons & Co.
Dunkirk, 33 pks. "
Antwerp, 42 "
Hamburg, 21 "

Dyestuffs—
Madders
Rotterdam, 6 cks. W. & C. L. Ringrose
Sumac
Trieste, 50 bls. Wilson Sons & Co.
Fiume, 316 bgs. "
Palermo, 2,049 "

Alizarine
Rotterdam, 11 pks. W. & C. L. Ringrose
" 10 cks. Hutchinson & Son
" 12 pks. W. & C. L. Ringrose
" 10 cks. Hutchinson & Son
" 16 pks. W. & C. L. Ringrose

Indigo
Amsterdam, 8 chts.

Glucose—
Hamburg, 100 bgs. A. C. Hornstedt & Co.
Stettin, 1,200 Wilson Sons & Co.
" 100

Glycerine—
Amsterdam, 10 pks. W. & C. L. Ringrose

Napthol—
Rotterdam. 1 ck. G. Lawson & Sons

Stearine—
Rotterdam, 15 bgs. Wilson Sons & Co.

Sulphite—
Christiansand, 100 bgs. Wilson Sons & Co.

Soap—
Bari, 30 cs. Wilson Sons & Co.

Sulphur—
Catania, 6,156 pks. Wilson Sons & Co.
" 51 t.

Saltpetre—
Hamburg, 2 cks.

Tar—
Archangel, 3,423 brls.

Waste Salt—
Hamburg, 406 bgs.

GOOLE.

Week ending Oct. 8th.

Alum—
Rotterdam, 6 cks.

Antimony—
Boulogne, 1 ck. 3 cs.

Chrome Alum—
Rotterdam, 5 cks.

Caoutchouc—
Boulogne, 8 cks.

Dyestuffs—
Alizarine
Rotterdam, 32 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 9 cs. 99 cks.

Glucose—
Hamburg, 140 bgs. 60 cks.
Dunkirk, 120

Naphthylamine—
Rotterdam, 1 ck.

Potassium Muriate—
Rotterdam, 26 cs.

Potash—
Calais, 42 drms. 11 cks.

Saltpetre—
Rotterdam, 100 bgs.

Soda—
Rotterdam, 40 brls.

Waste Salt—
Hamburg, 120 t. 602 bgs.

Zinc Oxide—
Antwerp, 23 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 8th.

Acetic Acid—

Algoa Bay,		7 c.	£9
Wellington,	100 jrs. 30 cks.		128
Trinidad,		3	3
Barbadoes,		6	6
Wellington,		2	5
Brisbane,	8 pks.		50
Adelaide,		1	4

Ammonium Carbonate—

Yokohama,	20 c.		£38
"	20		38
Hamburg,	22 cks.		101
Boston,	2		4
Newcastle,	60		105
Melbourne,	5		9
Libau,	10 kgs.		20
Halifax,	1 cks.		9
Hamburg,	4		32

Ammonia—

Gothenburg,	5 c.		£10

Alum Cake—

Calcutta,	241 cks.		£186
Dunedin,	2 t.		7

Alum—

Sydney,	10 c.		£3
"	10		5

Arsenic—

Yokohama,	20 kgs.		£15
Melbourne,	2 t.	10 c.	40

Ammonium Sulphate—

Antwerp,	10 t.		£115
Hamburg,	200		2,400
Rotterdam,	20	9 c.	228

Acids *(otherwise undescribed)*

Calcutta,	11 pks.		£25
Cologne,	230 btls.		370
Demerara,	1 cs.		5

Ammonium Muriate—

Gothenburg,	18 c.		£23

Bisulphate of Lime—

Oporto,	1 hd.		£10
Bombay,	22 c.		16
Calcutta,	26		16

Bisulphide of Carbon—

Rotterdam,	40 c.		£24

Borax—

Rotterdam,	10 c.		£16
Gothenburg,		4 cks.	29
Stettin,	1		15
Montreal,	10		14
Auckland,	11		58
Sydney,	36 cs.		145

Blue Stone—

Wellington,	10 c.		£13

Brimstone—

Berbice,	4 t.	3 c.	£32

Citric Acid—

Melbourne,	40 cs.		£142
Genoa,		10 c.	80
Melbourne,	1		5
Lisbon,		6	36
Paris,		10	74

Citric Acid—*continued.*

Ternuezen,		10 c.	£75
Amsterdam,		2	14
Hamburg,		40	267
Genoa,		10	74
Cologne,		10	72
Barcelona,	2 cks.		72
Algoa Bay,		3	21
Calcutta,		1	8
Montreal,		4	29
Constantinople,		1	8
Genoa,	1 ck.		40
Barcelona,	2		70
Hamburg,	5		182
St. Petersburg,	35		830
Hamburg,	11 kgs. 5 cks.		265
Lisbon,	5		40

Caustic Soda—

New York,		816 c.	£498
Melbourne,	1 t.	16	55
Algoa Bay,		10	15
Launceston,	6 t.	7	66

Carbolic Acid—

Yokohama,		18 c.	£92
Antwerp,	62 cks.		926
Algoa Bay,	2 cs.		7
Treport,		27	65
Dunkirk,	28 t.		1,698
Genoa,		14	35
Colombo,		11	33

Cream of Tartar—

Wellington,		2 c.	£10
Sydney,		20	111
Melbourne,		30	151
Sydney,		20	130
Melbourne,		30	151
Wellington,		4	23
Melbourne,		21	103
Sydney,		11	52
"		20	106

Chromic Acid—

Singapore,		4 c.	£13

Copper Sulphate—

Leghorn,	5 t.		£100
Melbourne,		100 c.	88
Ghent,		6	6
Naples,		75	70
Genoa,		130	125
Melbourne,	10 t.		195
"	5		90
Ghent,		20	21
Ibrail,		40	38
Galatz,		100	96
Wellington,		20	20
Varna,		15	16

Copperas—

Varna,		114 c.	£13

Clarifiants—

Brussels,		24 c.	£13

Carbon Bisulphide—

Rotterdam,		44 c.	£27

Chloride of Lime—

Gibraltar,		4 c.	£5

Coal Products—
Pitch

Alexandria,	100 brls.		£29
St. John N. B.,		159 cks.	80
Kurrachee,	50		106

Pitch—*continued.*

Alexandria,	100 brls.		£30
Oporto,	50		17
Galatz,	130		37
Ibrail,	15		4
Dunsburg,	161 t.		270
Helsingfors,	200		270
Bordeaux,		20 cks.	6
Tar			
Calcutta,	75 rlts.		£56
Hamburg,	100 brls.		48
Stockholm,	250		113
Sydney,	2 cks.		2
Algoa Bay,	400 drms.		17
Galatz,	100 brls.		50
"	10		5
Ibrail,	35		18
Helsingfors,	700 rlts.		318
Benzole			
Calcutta,	1 cs.		£12
Rotterdam,	49 cks.		423
"	20		404
"	34 dms.		593
"	19 cks.	1 dm.	433
"	77		800
Calais,	40		808
Anthracene			
Rotterdam,	78 cks.		£448
Cologne,	32		770
Naphthaline			
Treport,	58 cks.		£51
"	50		343
"	52		200
Melbourne,	14 drms.		9

Chemicals *(otherwise undescribed)*

Cape Town,	6 bxs.		£17
Brisbane,	11 pks.		23
Montreal,	6 cs.		21
Calcutta,	6 cks.		12
Launceston,	22 pks.		23
Adelaide,	5 cks.		32
"	10 cs.		45
Alexandria,	1		13
Adelaide,	1 cks.		4
Launceston,	1 kg.	14 pks.	45
Brisbane,	1		12
Bombay,	1 brl.		10
Lisbon,	11 pks.		95
Sydney,	80	1 cs.	78
Casablanca,	4		23
Ghent,	2 cks.		12
Algoa Bay,	25 cs.		67
Melbourne,	2		15
"	400 kgs.		230
Auckland,	6 cs.		20
B. Ayres,	30		25
Wellington,	3 cks.		33
Melbourne,	6		35

Disinfectants—

Sydney,	10 cks.		£6
Lisbon,	3 cs.		11
Brisbane,	4		11
Calcutta,	7 t.	10 c.	84
Adelaide,	1 cs.		8
Melbourne,	34 pks.		38
Natal,	10 cks.		8
Dunedin,	10		11

Fluoric Acid—

Melbourne,	4 cs.		£30

Guano—

Rouen,	4 t.	29 c.	£50
Demerara,	30		300
Genoa,	50		500

Glycerine—

New York,		564 c.	£900

Insect Powder—

Sydney,	2 cs.		£26
Natal,	4		30

Manure—

Barbadoes,	40 t.		£400
Trinidad,	5		50
Jamaica,	5		50
Demerara,	5		50
Ghent,	100		1,200
Bordeaux,	30		160
Genoa,	24	10 c.	117
Oporto,	26		120
Rouen,	99		360
Havre,	25		100
Genoa,	50		250
Malaga,	151	12	1,175
Alicante,	107	19	840
Valencia,	490	5	4,903
Bordeaux,	6	13	35
Hamburg,	29	5	94
Auckland,	25	10	80
Hamburg,	9	17	50
Dunkirk,	40		480
Bordeaux,	55	3	440
Rouen,	14		60

Nitric Acid—

Jersey,	24 crbys.		£44
Melbourne,	1 cs.		9

Oxalic Acid—

Lisbon,	12 c.		£17

Phosphoric Acid—

Demerara,	6		£17
Trinidad,	17 c.		50

Phosphorus—

Lisbon,	10 cs.		£72
Dunedin,	23		168
Melbourne,	5 cs.		39

Pearl Ashes—

Oporto,	18 c.		£16

Potassium Chlorate

Hiogo,	100 c.		£219
Yokohama,	50		110
Hiogo,	7 t. 60		436
Boston,	150		346

Potash—

Calcutta,	18 cs.		£166
Kurrachee,	3		24

Potash Crystals—

Brussels,	2 c.		£12

Soda Crystals—

Freemantle,	2 t. 15 c.		£12
Auckland,	40		7

Soda Ash—

Oporto,	23 c.		£8
Launceston,	6 t.		41

Sodium Sulphate—

Ghent,	50 t.		£50

Sulphuric Acid—
E. London, 10 cs. £15
Penang, 23 c. 12
Natal, 4 6
Algoa Bay, 40 pks. 35
Natal, 30 20
Algoa Bay, 30 18
Aden, 10 7

Sheep Dip—
Algoa Bay, 475 drms. £165
E. London, 376
Pt. Elizabeth, 3 250
Natal, 25 cs. 70
Wellington, 150 415
Natal, 350 152
Auckland, 25 190
San Francisco, 300 650

Saltpetre—
Launceston, 10 c. £13
Sydney, 100 110
Syra, 68 70
Auckland, 25 28
Oporto, 74 75
,, 150 150
Sydney, 10 11
Melbourne, 2 t. 20 67

Salammoniac—
Antwerp, 1 ck. £10
B. Ayres, 1 cs. 10
Gothenburg, 23 c. 40
Varna, 6 10

Soda—
Townsville, 202 c. £34

Sodium Acetate—
Adelaide, 10 cks. £76

Sulphur—
Algoa Bay, 18 c. 11
Sydney, 1 t. 3 9

Sodium Tartrate—
Melbourne, 5 c. £23

Sugar of Lead—
Bombay, 21 c. £25

Superphosphate—
Pt. Natal, 10 c. £6

Sodium Bicarbonate—
Sydney, 50 c. £16
Napier, 40 11
Melbourne, 5 11

Tartaric Acid—
Cape Town, 3 c. £22
Melbourne, 30 199
Havre, 1 ck. 32
Melbourne, 21 126
Wellington, 5 35
Auckland, 5 35
Freemantle, 4 28
Wellington, 2 13
,, 3 20
Sydney, 20 142
Melbourne, 50 330
Newcastle, 3 cs. 21
Montreal, 8 56
Newcastle, 20 130
Napier, 2 kgs. 14
Hamburg, 10 67
Sydney, 20 118

LIVERPOOL.

Week ending Oct. 11th.

Alkali—
St. Petersburg, 50 cks.
Hamburg, 26

Ammonium Sulphate—
Valencia, 50 t. 1 c. 2 q. £625
New York, 25 7 2 291
Antwerp, 40 10 486
St. Petersburg 9 19 114
Tonnay Charent, 51 t. 612

Ammonium Carbonate—
Odessa, 1 t. £33
Hamburg, 1 2 c. 1 q. 36
Leghorn, 15 25
Marseilles. 6 5
San Sebastian, 10 61

Albumen—
Vera Cruz, 5 c. £22

Acetic Acid—
Vera Cruz, 1 t. 4 c. £20

Alum—
Syra, 1 t. 9 c. £8
Vera Cruz, 11 7
Calcutta, 29 4 146
Cape Town, 1 1 q. 5
Constantinople, 3 1 16
Odessa, 5 1 26
Barcelona, 5 8 33
Bari, 1 1 5
Madras, 21 8 2 108
Toronto, 3 13 19

Antimony Regulus—
Rotterdam, 2 t. £146

Acid *(otherwise undescribed)*
Santos, 10 crbys. £6

Ammonium Muriate—
Marseilles, 1 t. 13 c. 1 q. £30
New York, 6 15 170

Alum Cake—
Calcutta, 9 t. 10 c. £28

Bleaching Powder—
Boston, 243 cks. 86 tcs.
Calcutta, 102 cs.
Corunna, 17 brls.
Genoa, 28 cks.
Ghent, 133
Montreal, 64
New York, 257
Odessa, 15
Piræus, 32 brls.
Baltimore, 110 cks.
Hamburg, 26
Havana, 10 cs.
Montreal, 30
Naples, 22
New York, 96
Philadelphia, 50
Rouen, 47
Terneuzen, 25
Venice, 19

Brimstone—
Calcutta, 16 t. 5 c. £82
Sourabaya, 6 7 1 q. 57

Borax—
Sydney, 3 t. 12 c. £113
Rotterdam, 4 14 132
Malta, 4 6
Bilbao, 5 3 q. 8
Odessa, 70 6 100
" 1 1 2 33

Bone Waste—
Barcelona, 26 t. £26

Copperas—
Smyrna, 2 t. 10 c. £7
Galatz, 5 19
Constantinople, 3 1 1 q. 7
Malta, 7 10 15
Quebec, 13 4 30
Samsoun, 3 17 8
Syra, 3 13 7

Caustic Soda—
Almeria, 4 cks. 6 dms.
Barcelona, 300
Bari, 18
Boston, 489
Corunna, 36 brls. 16
Genoa, 33
Ibrail, 30
Malaga, 16
Montreal, 350
New Orleans, 100
New York, 150
Odessa, 100
St. Petersburg, 3 cs. 775
Seville, 50 brls. 100
Valencia, 32
Adelaide, 10 dms.
Amsterdam, 15
Ancona, 5
Barcelona, 54 brls.
Bari, 104
Boston, 585
Brisbane, 56
Havana, 35
Havre, 150
Maceio, 30
Madeira, 9
Madrid, 94
Mazatlan, 150 kgs.
Mexico City, 60
Montreal, 20
Nagasaki, 200
Naples, 6
New York, 1,018
Otago, 19
Pasages, 30
Rouen, 30
Santander, 10
Seville, 50
Sydney, 100
Tunis, 5
Venice, 4
Vigo, 30
Calcutta, 179
Ceara, 15

Caustic Potash—
Chicago, 13 c. £13
Napier, 17 17

Carbon Bisulphide—
Bahia, 9 c. £10

Calcium Chloride—
Penang, 3 t. £7
New York, 15 15

Citric Acid—
Rosario, 10 c. £75

Charcoal—
Nantes, 71 t. 312

Copper Sulphate—
Aleppo, 5 c. £5
Barcelona, 29 t. 19 533
Bilbao, 15 257
Bombay, 20 358
Bordeaux, 20 3 q. 343
Catania, 10 3 194
Patras, 5 5
Venice, 15 19 279
Hamburg, 14 18 2 262
Salonica, 1 3 20
Bordeaux, 18 17
Genoa, 36 18 678
Gothenburg, 2 4 37
Catania, 10 2 2 178
Corunna, 1 3 3 22
Genoa, 54 11 977
Hamburg, 2 3 1 40
Barcelona, 32 1 2 616
Ancona, 8 3 3 159
Antwerp, 1 10 26
Bordeaux, 10 171
Rotterdam, 7 2 127
Bilbao, 10 4 2 184
Venice, 33 10 3 622
Vigo, 10 3 196
Melbourne, 27 10 502
Antwerp, 2 2 40

Carbolic Acid—
New York, 1 t. 8 c. 3 q. £107
,, 2 1 100

Chemicals *(otherwise undescribed)*
Vera Cruz, 4 c. 2 q. £6
Lisbon, 49 t. 18 2 408
Vera Cruz. 10 20

Disinfectants—
Bombay, 4 t. 15 c. £30
Piræus, 5 cs. 18
Rio de Janeiro, 10 8
Bombay, 7 12 27

Epsom Salts—
Montreal, 10 brls.
Seville. 40
Montreal, 100
St. Paul's, 20
Seville, 10

Ground Spar—
Havre, 25 t. 12 c. £193

Guano—
Carthagena, 9 t. 19 c. 1 q. £89
Barcelona, 73 16 1 719

Iodine—
Hamburg, 1 t. 10 c. £900

Magnesium Carbonate—
Mayaguez, 1 c. 1 q. £5

Manure—
Bordeaux, 143 t. 19 c. 1 q. £985
St. Nazaire, 950 4,761
Malaga, 30 300
Havre, 99 4 3 407
Ghent, 9 15 3 48

Magnesia—
Bahia, 10 cs.
Rio de Janeiro, 20

Magnesium Chloride—
Bombay, 1 t. 3 q. £5
,, 10 5 c. 27
Rangoon, 3 5 3 33
16 1 10

Oxalic Acid—
New York, 10 t. 5 c. £332

Potashes—
Catania, 7 t. 19 c. 3 q. £158
Wellington, 1 2 25

Potassium Carbonate—
Chicago, 19 c. £14
New York, 7 t. 4 109

Potassium Bichromate—
Patras, 10 c. £17
Piræus, 1 t. 10 1 q. 40
Bombay, 16 34

Pitch—
Cadiz, 1 brl.
Carril, 8¾ t.
Cette, 1,900
Naples, 779

Picric Acid—
New York, 2 t. 1,522 q. £300

Potassium Prussiate—
New York, 2 t. 10 c. £210

Phosphorus—
Hong Kong, 1 c. £11
Shanghai, 8 3 q. 70
San Juan, 5 1 60

Potassium Chromate—
Havre, 3 t. 8 c. £90

Potassium Chlorate—
Boston, 2 t. 10 c. £116
Arica, 3 9
New York, 15 15 675
Odessa, 1 5 75

Potassium Chlorate—*continued.*
Hamburg, 2 7 27
Chicago, 2 10 117
Gothenburg, 25 1,070
Bilbao, 5 3 q. 8
New York, 5 233

Salt Cake—
Baltimore, 100 t. 18 c. £228

Saltpetre—
Havana, 9 c. £11

Sodium Biborate—
Antwerp, 5 t. 5 c. £158
Rotterdam, 1 11 47
St. Petersburg, 15 7 1 q. 461
Montreal, 13 2 21

Sulphuric Acid—
Panama, 8 c. £5

Sugar of Lead—
Toronto, 7 c. £9

Sodium Chlorate—
Boston, 2 t. 10 c. £142
Naples, 10 35

Sodium Silicate—
Gibraltar, 13 cks.
Seville, 50
Sydney, 7 brls.
Lisbon, 13
Montreal, 114
Odessa, 28
Rosario, 10
Volo, 5

Soda Crystals—
Boston, 280 brls.
Calcutta, 30 kgs.
Halifax, 80
Hamilton, 25
Malta, 50
Toronto, 350
Boston, 280
Montreal, 193
Pernambuco, 150 brls.
Samarang, 15

Soap—
Accra, 2 cs.
Barbadoes, 200 bxs.
Bilbao, 2 brls.
Bombay, 26
Calcutta, 6
Callao, 23
Carthagena, 100
Demerara, 570
Gibraltar, 100
Hong Kong, 111
Java, 4,746
Landana, 125
Manila, 4
New York, 39
Old Calabar, 425
Rotterdam, 50
Sierra Leone, 100
Accra, 62
Algoa Bay, 7
Barbadoes, 600
Bluefields, 400
Bombay, 3 255 8 cks.
Calcutta, 250 pks.
Cameroons, 50
Ensenada, 30
Ferrol, 14
Genoa, 200
Gibraltar, 525
Gr. Canary, 260
New York, 62 300 3 cks.
Rotterdam, 600
St. Lucia, 200
Toronto, 100
Para, 400

Salt—
Bakana, 40 t.
Benin, 22
Bonny, 20
Boston, 300
Buguma, 180
Calcutta, 657
Cameroons, 20
Cape Palmas, 15
Cape Lopez, 10
Chicago, 150
Degama, 50
Demerara, 59
Dunedin, 50
Gothenburg, 500
Guayaquil, 1¼
New Orleans, 100
Old Calabar, 249 18 c.
Para, 16 14
Portland, 1,030 10
Rotterdam, 57
St. John, 700
Salt Pond, 6¼
Sierra Leone, 100
Trinidad, 62 4
Rio de Janeiro, 8
San Francisco, 500,

Salt—*continued.*
Aalborg, 156 t.
Antwerp, 20
Cameroons, 20
Charlotte Town, 314
Copenhagen, 86
Fernando Po, 5
Fleusburg, 311
Ghent, 60
Halifax, 340
Iceland, 95
Kolding, 188
Montreal, 756
Mussera, 5
Old Calabar, 40
Sydney, 108¼
Victoria, W. A., 20
B. Ayres, 30

Soda Ash—
Barcelona, 50 brls.
Boston, 27 tcs.
Latakia, 20 cks.
Lisbon, 15
Madrid, 114
Montreal, 150
New York, 93 510
Philadelphia, 138
Rio de Janeiro, 100
Seville, 50
Syra, 145
Toronto, 70
Bremerhaven, 2
Adelaide, 31
Baltimore, 114 137
Beyrout, 35
Boston, 1,589 bgs.
B. Ayres, 300
Carthagena, 20
Corfu, 50
Georgetown, 52
Madeira, 2 cks.
M. Video, 50
Montreal, 70
Naples, 50
New Glasgow, 16 tcs.
New Orleans, 191
New York, 499 230
Rio Janeiro, 150 brls.
Sherbrooke, 13 tcs.
Smyrna, 100
Varna, 100

Sodium Bicarbonate—
Calcutta, 1,400 kgs.
Charlotte Town, 100
Guantanamo, 1 ck.
Hamburg, 9
Hiogo, 200
Madrid, 30
Montreal, 330 25
Quebec, 25
St. Petersburg, 300
Almeria, 47
Calcutta, 750
Charlotte Town, 30
San Sebastian, 10

Sodium Carbonate—
Boston, 168 brls.
Charlotte Town, 5
Montreal, 84

Sulphur—
Mossel Bay, 2 t. 4 c. £23
Montreal, 75 225
Madras, 1 7
New York, 50 2 225
Cape Town, 17 3 q. 7
Charlotte Town, 11 2 5
Cienfuegos, 1 13 1 11
Mazatlan, 13 18 2 94

Superphosphate—
Bilbao, 100 t. £200

Sodium Nitrate—
Almeria, 3 t. 5 c. 3 q. £55
Fiume, 6 4 3 53
Trieste, 5 2 42
Valencia, 3 28
Fiume, 6 7 1 55

Sheep Dip—
Algoa Bay, 11 t. £450
Natal, 6 350
B. Ayres, 19 19 c. 810
Christchurch, 590 pks. 553
E. London, 2 6 96

Salammoniac—
Syra, 4 c. 3 q. £8
,, 5 3 18
Marseilles, 8 2 15
Santander, 1 t. 2 36
Barcelona, 2 3 1 73
Genoa, 1 10 57
Hamburg, 1 34

Tar—
Loango, 15 brls.

Tartaric Acid—
Rosario, 2 t. 2 c. £272
Vigo, 2 14

HULL.

Week ending October 14th.

Alkali—
Wyburg, 2 cks.

Alumino Ferric—
San Francisco, 10 cks.

Barytes—
San Francisco, 19 cks.

Bone Size—
Harfingen, 19 cks.

Bleaching Powder—
Abo, 30 cks.
Bergen, 18
Gothenburg, 2
Rotterdam, 4

Caustic Soda—
Bergen, 2 drms.
Danzig, 60
Hango, 5
Helsingfors, 45
Konigsberg, 49
Reval, 115 25 cks.
Riga, 536
St. Petersburg, 150
Wyburg, 25

Chemicals (*otherwise undescribed*)
Amsterdam, 8 pks.
Abo, 9 cks.
Antwerp, 35
Bremen, 2 cs.
Bombay, 260 2,617
Bergen, 35
Christiania, 14 29
Copenhagen, 10 8 16
Constantinople, 50
Danzig, 11
Gothenburg, 40 pks 45 70 1,410 slbs.
Hamburg, 26 18 352
Harlingen, 2 1
Helsingfors, 6
Kurrachee, 100
New York, 40
Odessa, 351 373
Rouen, 16
Riga, 3
Rotterdam, 220 53 56
Stockholm, 1
St. Petersburg, 20
Stettin, 32

Dyestuffs—
Myrabolams
Dunkirk, 80 bgs.
Dyestuffs (*otherwise undescribed*)
Antwerp, 6 cks.
Boston, 8
Bombay, 38 173 pks.
Gothenburg, 1 bl.
Hamburg, 4 drms.
Kurrachee, 20
Reval, 15 12
Rotterdam, 6 cs. 13 bgs.
Stettin, 135 c. 130

Manure—
Dunkirk, 1,217 bgs.
Ghent, 200
Rouen, 44

Pitch—
Bombay, 100 cks.
Cadiz, 175 t.
Odessa, 3

Soap—
Bombay, 6 cks.
Hamburg, 5

Tar—
Bombay, 100 cks.
Christiania, 3
Gothenburg, 25
Ghent, 1 cs.
Hamburg, 5
Helsingfors, 100 cks.
San Francisco, 100

Turpentine—
Christiania, 3 cks.

TYNE.

Week ending October 15th.

Arsenic—
Venice, 4 t. 13 c.

Alkali—
Amsterdam, 26 t.
,, 17 7 c.
St. Petersburg, 25 10
,, 54 11
Ergastiria, 5
Antwerp, 10 3
Christiania, 11 10
Aalborg, 6 3
Copenhagen, 32 8
Rotterdam, 3 1

Antimony—
Hamburg, 2 t. 10 c.
Copenhagen, 6
Rotterdam, 10

Ammonia—
Antwerp, 30 t.

Alum Cake—
Copenhagen, 10 t. 7 c.

Alum Earth—
Dunkirk, 5 t.

Bleaching Powder—
Venice, 2 t. 17 c.
Montreal, 25 5
Amsterdam, 34 2
,, 11 17
St. Petersburg, 92 4
,, 228 16
,, 191 8
Hamburg, 48 13
,, 20 8
,, 60 16
Antwerp, 59 4
Christiania, 4 17
,, 1 7
,, 3 5
Copenhagen, 52 8
Dunkirk, 20 3
Danzig, 7 17
Lisbon, 21 1
Rotterdam, 9 7
,, 20 7
Dunkirk, 15 3
Ghent, 9 5

Creosote Oil—
Bergen, 4 c.

Copperas—
Aalborg, 3 t.
Aarhuus, 14 c.

Caustic Soda—
Montreal, 14 t. 10 c.
Copenhagen, 2 18

Litharge—
St. Petersburg, 6 t. 4 c.
Hamburg, 4 12
,, 5

Magnesia—
Hamburg, 4 c.
Antwerp, 2

Potassium Chlorate—
St. Petersburg, 6 t.

Potassium Carbonate—
Antwerp, 1 t. 2 c.

Pitch—
Malmo, 201 c.
Montreal, 46 t. 1
,, 51 17
Bilbao, 5 6

Salammoniac—
St. Petersburg, 44 t. 12 c.

Sodium Hyposulphite—
St. Petersburg, 9 t. 9 c.

Superphosphate—
New Orleans, 2,000 t. 6 c.

Sodium—
Antwerp, 1 cs.

Soda Ash—
Venice, 20 t. 4 c.
Hamburg, 10 18
Christiania, 28 14
Aalborg, 14 10
,, 7 8
Libau, 10 3
Dunkirk, 146 1
Lisbon, 46 6

Soda Crystals—
Amsterdam, 5 t. 10 c.
Aalborg, 13 6
,, 17 11
Aarhuus, 1 12
,, 22 6

Soda—
Venice, 6 t. 1 c.
Montreal, 30
Copenhagen, 25
Nakskov, 4 15
,, 4 16
Svendborg, 4 12
,, 13 16
Rotterdam, 31 17
,, 22 7

Sodium Silicate—
Malta, 14 t. 11 c.

Sodium Sulphate—
Lisbon, 49 t. 9 c.

Sulphur—
Rotterdam, 5 t.
Gothenburg, 50 7 c.

Tar—
Montreal, 100 t.

Zinc Oxide—
Lisbon, 1t. 20 c.

GRIMSBY.

Week ending October 11th.

Coal Products—
Dieppe, 10 cs. 116 cks.

Chemicals (*otherwise undescribed*)
Dieppe, 8 cks. 82 cs.

Pitch—
Dieppe, 50 bgs.

GLASGOW

Week ending October 16th.

Ammonium Sulphate—
Bilbao, 10 t. 3¼ c. £125

Bleaching Powder—
Melbourne, 121 c. £40

Borax—
Rotterdam, 12 cks. £132

Benzole—
Rotterdam, 15 pns. £120

Charcoal—
Antwerp, 5 t. 1 c. £20

Chemicals (*otherwise undescribed*)
Barcelona, 48 t. 1¼ c. £1 271

Dyestuffs—
Logwood
Lisbon, £55
Extracts
Quebec, £153
Dyestuffs (*otherwise undescribed*)
Lisbon, 31¾ c. £30
Barcelona, 25¾ 37

Epsom Salts—
Christiania, 50 bgs. £20

Litharge—
Montreal, 8 t. 18½ c. £184
,, 23 4½ 380

Manure—
Java, 1,001¾ £501
Hong Kong, 9 t. 6¾ c. £89

Magnesia—
Barcelona, 9 t. 9¼ c. £186

Paraffin Wax—
Trieste, 4 t. 17¾ c. £110
Bilbao, 4 3½ 35
Cape Colony, 6 3 187
Antwerp, 3 13¾ 111
Barcelona, 41 12 1,384

Potassium Bichromate—
Antwerp, 15 t. 11¼ c. £376
Lisbon, 80 120
Christiania, 1 ck. 10
Quebec, 82 144
Rotterdam, 63 730
Antwerp, 5 t. 12¾ 140
Barcelona, 5 11½ 172
Rotterdam, 12 cks. 160

Pitch—
Trieste, 303 t. 19 c. £383
Rochefort, 916 14 733

Potassium Prussiate—
Quebec, 16¼ c. £66
Amsterdam, 3 cks. 80

Sodium Bichromate—
Melbourne, 26½ c. £42
Quebec, 63 81

GOOLE.

Week ending Oct. 8th.

Benzole—
Ghent, 8 drms.
Rotterdam, 58 cks.

Coal Products—
Dunkirk, 10 cks.
Rotterdam, 48

Chemicals (*otherwise undescribed*)
Antwerp, 2 cks.
Ghent, 1

Dyestuffs (*otherwise undescribed*)
Boulogne, 1 cs. 4 cks. 4 drms.
Ghent, 1
Hamburg, 1 cs.

Manure—
Antwerp, 215 bgs.
Boulogne, 55

Pitch—
Antwerp, 453 t.

PRICES CURRENT.

WEDNESDAY, OCTOBER 22, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/-	&	12/-
,, Glacial .. .. ,,			55/-
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¼
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	6	6
,, (free from arsenic, 140/145°) .. .. ,,	1	10	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/-	&	35/-
,, Nitrate .. . . per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	11	3
Aniline Oil (pure) .. .. per lb.	0	0	11
Aniline Salt ,, ... ,,	0	0	10¼
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/-	to	75/-
Bleaching Powder, 35 % .. .. ,,	5	15	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6	to	35/-
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. per gallon	0	4	7½
,, 50/90 ,, ... ,,	0	3	6
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¼
,, (crude 60°) .. .. per gallon	0	1	7
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	58	10	0
,, Sulphate .. .. ,,	18	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	10	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	10	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	10	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/-	&	42/6
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	6
Oils:—			
Cotton-seed .. .. per ton	21	0	0
Linseed .. .. ,,	25	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅛
,, American .. .. ,,	0	0	5⅛
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¼
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	3	5	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	1½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	17	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	7	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¼
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	15	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	6	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	31	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¼
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	5	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	100	0	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	24	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	7	6

THE

CHEMICAL TRADE JOURNAL.

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We cannot undertake to return rejected manuscripts or drawings, unless accompanied by a stamped directed envelope.

Readers are invited to forward items of intelligence, or cuttings from local newspapers, of interest to the trades concerned.

As it is one of the special features of the *Chemical Trade Journal* to give the earliest information respecting new processes, improvements, inventions, etc., bearing upon the Chemical and allied industries, or which may be of interest to our readers, the Editor invites particulars of such—when in working order—from the originators; and if the subject is deemed of sufficient importance, an expert will visit and report upon the same in the columns of the *Journal*. There is no fee required for visits of this kind.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates :—

30 Words and under ..... 2s. od. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

Advertisements of Situations Wanted are inserted at one-half the above rates when prepaid, viz:—

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Trade Advertisements, Announcements in the Directory Columns, and all Advertisements not prepaid, are charged at the Tariff rates, which will be forwarded on application.

THE SCIENCE WITH A BIG "S."

WE do not doubt the possibility of popularising Science, on the contrary, we know that Science—even Technical Science—has been presented in popular style to what is generally known as a popular audience, with conspicuous success. But it is necessary that the populariser of Science should be a man of a peculiar stamp, a man who combines clearness of ideas with a happy gift of lucid exposition and statement, and, above all, accurate and extensive knowledge of the subject of which he treats. It is to be regretted that many of those who pose before the public as popularisers of Science, either on the platform, at the lecture table, or in the press, are lamentably lacking in one or other of the above qualifications, and as regards Technical Chemistry, with which we are at present most concerned, we may add, as a rider, generally the last. We have before us an article on one of our great centres of chemical manufacture, in a contemporary publication, which, while excellent enough in the domain of literature, has apparently gone out of its depth when plunging into Technical Chemistry.

We read of this town :—"It is, to put it mildly, nothing but a mass of sheds and cisterns and towers. Its myriad chimneys are always, with the exception of a brief respite at Whitsuntide, pouring out volumes of black smoke and offensive vapours which, between them, tarnish all bright metals and make trees and fields in the neighbourhood look as if they had been scorched by the sun. Its works discharge yearly thousands of tons of waste, which is heaped up in all directions." This will do very nicely, and is not, perhaps, very wide of the mark; but what shall we say of this? "One cannot go far about chemical works without noticing many immense leaden cisterns. These are full of strong vitriol, which is made by burning sulphur and saltpetre together in long brick chambers, and it is some time before one can go near them without thinking of what a terrible death would befall the hundreds of men about a works if one were to break or give way."

This is Popular Science with a vengeance. Full of strong vitriol! Fancy a structure of six or eight pound lead, say twenty feet high *full* of strong vitriol, It is a poor compliment to the "hundreds of men about a works," to imagine that they would trust themselves within a gunshot of anything of the kind. We fear that chemical engineers and contractors must have made some essentially grave error in the construction of the works in question. We fancy we know what class of structure is referred to as a cistern in the paragraph, if it is a vitriol chamber, we have seen a few such give way. We have seen one end of a vitriol chamber utterly collapse, but in this instance the plant was of very slender construction, and there was no worse result than an attack on the proprietor's purse, Then the accurate description of the process would do credit to a scientific teacher of Malapropian proclivities, for *strong vitriol is made by burning sulphur and saltpetre together in long brick chambers!* The process is simplicity itself, to say nothing of the writer of the description, who has evidently been in a chemical

PRICES CURRENT.

WEDNESDAY, October 22, 1890.

Prepared by Higginbottom and Co., 116, Portland Street, Manchester.

The values stated are f.o.r. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 % and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	6	6
,, (free from arsenic, 140/145°) .. .. ,,	1	10	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/-& 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	12	6
,, ,, (grey), Hull .. .. ,,	11	11	3
Aniline Oil (pure) .. .. per lb.	0	0	11
Aniline Salt ,, ... ,,	0	0	10¼
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	15	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	7½
,, 50/90 ,, ... ,,	0	3	6
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¼
,, (crude 60°) .. .. per gallon	0	1	7
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	6
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	10	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	9
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	58	10	0
,, Sulphate .. .. ,,	18	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	10	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	10	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	10	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	6
Oils:—			
Cotton-seed .. .. per ton	21	0	0
Linseed .. .. ,,	25	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅛
,, American .. .. ,,	0	0	5⅛
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	3	5	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	1½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	5	17	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	7	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¼
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	15	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	6	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	31	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	[illegible]
,, Silicate (glass) .. .. per ton	5	[illegible]	
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	[illegible]	
,, Stannate, 40 % .. .. per cwt.	[illegible]		
,, Sulphate (Salt-cake) .. .. per ton.	[illegible]		
,, ,, (Glauber's Salts) .. .. ,,			
,, Sulphide .. .. ,,			
,, Sulphite			
Strontium Hydrate, 98 %			
Sulphocyanide Ammonium, 95 %			
,, Barium, 95 %			
,, Potassium			
Sulphur (Flowers)			
,, (Roll Brimstone)			
,, Brimstone: Best Quality			
Superphosphate of Lime (26 %)			
Tallow			
Tin (English Ingots)			
,, Crystals			
Zinc (Spelter)			
,, Chloride (solution, 96° Tw. ..			

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[illegible]e or To be Let, [illegible]te Contract, are [illegible]ion.

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THE SCIENCE WITH A BIG "S."

WE do not doubt the possibility of popularising Science, on the contrary, we know that Science—even Technical Science—has been presented in popular style to what is generally known as a popular audience, with conspicuous success. But it is necessary that the populariser of Science should be a man of a peculiar stamp, a man who combines clearness of ideas with a happy gift of lucid exposition and statement, and, above all, accurate and extensive knowledge of the subject of which he treats. It is to be regretted that many of those who pose before the public as popularisers of Science, either on the platform, at the lecture table, or in the press, are lamentably lacking in one or other of the above qualifications, and as regards Technical Chemistry, with which we are at present most concerned, we may add, as a rider, generally the last. We have before us an article on one of our great centres of chemical manufacture, in a contemporary publication, which, while excellent enough in the domain of literature, has apparently gone out of its depth when plunging into Technical Chemistry.

We read of this town:—"It is, to put it mildly, nothing but a mass of sheds and cisterns and towers. Its myriad chimneys are always, with the exception of a brief respite at Whitsuntide, pouring out volumes of black smoke and offensive vapours which, between them, tarnish all bright metals and make trees and fields in the neighbourhood look as if they had been scorched by the sun. Its works discharge yearly thousands of tons of waste, which is heaped up in all directions." This will do very nicely, and is not, perhaps, very wide of the mark; but what shall we say of this? "One cannot go far about chemical works without noticing many immense leaden cisterns. These are full of strong vitriol, which is made by burning sulphur and saltpetre together in long brick chambers, and it is some time before one can go near them without thinking of what a terrible death would befall the hundreds of men about a works if one were to break or give way."

This is Popular Science with a vengeance. Full of strong vitriol! Fancy a structure of six or eight pound lead, say twenty feet high *full* of strong vitriol, It is a poor compliment to the "hundreds of men about a works," to imagine that they would trust themselves within a gunshot of anything of the kind. We fear that chemical engineers and contractors must have made some essentially grave error in the construction of the works in question. We fancy we know what class of structure is referred to as a cistern in the paragraph, if it is a vitriol chamber, we have seen a few such give way. We have seen one end of a vitriol chamber utterly collapse, but in this instance the plant was of very slender construction, and there was no worse result than an attack on the proprietor's purse, Then the accurate description of the process would do credit to a scientific teacher of Malapropian proclivities, for *strong vitriol is made by burning sulphur and saltpetre together in long brick chambers.* The process is simplicity itself, to say [illegible] of the description, who has evidently been [illegible]

works under peculiar conditions. We go on to learn that caustic-making consists in boiling the liquid for some time in large *shallow* pans. To get out of his depth in a shallow pan says little for the writer in question. We should certainly not call half an egg shallow.

Here is another :

"Some years back a man fell into a large vat containing this fluid (vitriol), we believe, or, at any rate something of the kind. A fellow workman raised an alarm immediately, and very soon efforts were made to extricate him. But the only traces of the poor fellow that could be found were a few buttons, and the iron from the bottom of his clogs; the vitriol, or whatever it was, had disposed of the rest."

Our popular scientist's informant had a keen eye to the dramatic side of the subject. But on the following the writer speaks simply from his own experience.

"On one occasion, when the writer was going through a works, a single drop of some liquid fell on his arm, burning out, in a week or so, a piece of cloth about the size of a small plate, and thus rendering the coat worthless."

"A single drop!" "The size of a 'small' plate!" This is getting a drop too much indeed. Please note that it was "some liquid," the writer has carefully kept the name of the works and the name of the liquid secret, so we are deprived the opportunity of obtaining a sample of this potent destructive agent. Then we get the following glimpse of what must indeed be a new process. We have not yet been privileged to see it ourselves.

"And one gets an extreme, though very useful, idea of the terrible stuff with which some of them have to deal from the process followed in concentrating muriatic acid to the highest possible strength. It has to be distilled in a retort. This vessel cannot be made of glass, for that is unsafe, and if any base metal were employed, the fiery acid would dissolve it as if it were so much jelly. The metal used is platinum."

This is accuracy itself, and how thrilling the language "terrible stuff," "fiery acid," "jelly." This process of concentrating muriatic acid in platinum, because it is unsafe to do so in glass, wants close watching, we commend it to our readers, on account of its novelty. There may be money in it. Who knows?

One more quotation. "The most eloquent illustration of what the workmen have to contend against is found in the fact that it is not an uncommon occurrence in chemical districts to find a man insensible. For this condition a new and appropriate verb has been invented."

"'He is chemicked!' the natives say."

We have kept this on account of its being an appropriate conclusion. We remember a well-known professor of chemistry who, after being shown through a chemical works, was under the impression that the chlorine chambers were the vitriol plant, and sundry other erroneous notions. To him the "natives" applied another verb, which would be equally appropriate to the writer we have quoted. They said he had been "gassed."

WOOD CONSUMPTION.—At a recent meeting of the Forestry Association of Saxony, the rapid destruction of forests involved in the providing of wood for papermaking was touched upon, and, according to statements made by some of the members, it would appear that upwards of half-a-million cubic metres of wood had been used in Saxony alone for the purpose of making wood pulp. This, it was stated, was about 60% of the total amount of wood cut in the Saxon forest district, and the surface necessary for the growth of that quantity of wood was about 125,000 hectares (nearly 290,000 acres).

MANURE ADULTERATION.

THOSE who read the quarterly reports of the Chemical Committee of the Royal Agricultural Society of England have for years past been impressed with the fact, not only that the manure trade has much mixed up with it that is absolutely fraudulent, but that it offers special temptation to fraud. The Norfolk Chamber of Agriculture has recently been discussing the use and valuation of manures, and in the paper with which the meeting commenced, Mr. Thomas Brown, of Lynn, gave some figures which ought to do great service to the farmers of the country. He calculated that each year over 1,000,000 tons of artificial manures are used in this country, and that, taking ten tons as the average purchased by each user, these were consumed on 100,000 farms. But little is done to prevent or expose gross fraud or adulteration in this great trade. The number of samples of artificial manures sent to the Royal Agricultural Society's laboratory is only about 500 annually. Mr. Brown assumes that four times as many are tested in local laboratories. Adding all together, and not allowing for the fact that the same buyer may send more than one sample in a year, we discover that only two purchasers out of every 100 consumers of artificial manures concern themselves about the quality of their purchases. "This fact," we are further told, "is not concealed from the dishonest manure maker."

These figures and estimates given by Mr. Brown open up a great train of thought. The quarterly reports of the Chemical Committee of the Royal Agricultural Society represent less than half of 1% of the artificial manure purchased by the farmers of this country. The buyers who use the society are, as a rule, the better class of farmers—men who are alive to the need of protecting themselves, who, as a rule, buy by some sort of guarantee, and who pay prices which should insure a good and genuine article. Yet every quarter the society's report is full of gross cases of adulteration and fraud. It may, therefore, be assumed that it is the more wide-awake class of farmers who use the chemist to determine the value of their purchases, and that even these, with all the precautions they take, are very often defrauded. What must be the state of things with the other 98 happy-go-lucky purchasers out of every hundred—the men who take no means whatever of finding out whether their purchases are worthless or not? At a low estimate they spend something like £5,000,000. a year on artificial manures, and it is surely an important question whether they are defrauded out of a third of that sum or not. To the country at large it is important, for an injustice is done to the land if worthless manures are applied and crops consequently fail.

In other countries the purity of the manures sold to farmers is matter for Government solicitude. Mr. Brown pointed out that in Germany, France, the United States, and Canada the Governments have established public stations where farmers can have manures tested free of cost, and adulteration, if present, detected and punished. This is a matter which might well occupy the attention of our own Minister of Agriculture. There is no doubt that private enterprise has not achieved that success—*i.e.*, general adoption and use—which is essential to protect our agriculture from fraud and adulteration in an important article of farm consumption. Mr. C. S. Read hit off an important factor in the matter in the discussion before the Norfolk Chamber. With all the societies, he said, the fees for the analysis of manures were too high. They published elaborate tables of cheap fees for analysis, many of which were for articles of little interest to farmers, but when it came to manures the fees were always high ones. This must be so, as the analysis of manures is a complicated work, and one that must always be more or less expensive.

The societies have reduced the fees for this very considerably, and deserve immense credit for what they have done. But the time has come when the Government might very well take the matter up. In the *Times* of May 19 of the present year a summary of the new law now in force in France was given, and this together with the law in the United States would give a basis on which an enactment for this country might be usefully drafted. Briefly put, these two laws enact (1) that all manure shall be branded with the quality on its face; (2) that Government officials may at all times examine such bags and take samples, whether in stores or in transit; (3) that purchasers can at all times send samples of their purchases, with the name of the seller, the quality guaranteed, and the price paid, to Government laboratories; and (4) that in any case of adulteration the Government shall have power to prosecute and recover penalties. In France, the penalties are imprisonment from six days to one month, together with a fine of from £2. to £80. The enactment of some such law—relating not only to manures but to oil cakes and cattle foods—would be a great boon to the farmers of this country, and would not be opposed by the honest manufacturers of manures, cakes, and cattle foods.

THE AUSTRALIAN GAS ASSOCIATION, LIMITED.—This association recommend a dividend at the rate of 7 per cent. per annum for the half-year, ending June 30.

ANALYSIS OF FABRICS.

WE propose, in the present article, to show the various means adopted for determining the material of which the cloth is made, and, in the case of mixture yarns (Angolas, &c.), how to ascertain of what the mixture is composed, and the relative quantities of each.

A common and ready way for finding the difference between animal and vegetable fibres is to burn some of the threads of yarn in a flame. The vegetable fibre is composed of carbon, hydrogen, and oxygen, while the animal fibre, in addition to these, contains nitrogen. By burning, the threads used in testing the first mentioned fibre will result in carbonic acid and water, while those of the latter, or of animal fibre, will result in combinations containing nitrogen, which element readily makes itself known by its peculiar smell, or disagreeable odour, similar to burnt feathers. Another point, which it is well to note, is the rapidity with which the thread composed of vegetable fibre burns, as compared with the thread having an animal substance as basis. In the latter case, only a little bunch of porous carbon forms itself at the end submitted to the flame, and there is no flame, as in the case of the former.

Another method is to untwist the threads, and note carefully the appearance of the released fibres. If they are wool fibres, they will be waved in exactly the same way as in the raw wool—the finer the wool, the greater the number of waves or corrugations that will be shown. On the other hand, cotton fibres will maintain the same straitness which they show in the raw state. We might, with advantage, employ the microscope, as, by this means, we shall be able more readily to determine what is the nature of the fibres under observation. Under the microscope, wool fibres can be detected by the scales which are upon the surface, and which overlap each other after the manner of scales upon the back of a fish. This peculiar property belongs to all qualities of wool and hair. Cotton, under the microscope, shows as a thin transparent ribbon twisted, without any of the scaly appearance noticed in the wool, while silk has the appearance of a glass rod divided in the middle.

In some instances, owing to the effect of finishing and milling, and especially in the case of materials which have been previously worked up, the above tests may be unreliable, or so undefined that they cannot be trusted. In such cases, we should have a means of testing or analysing, that can be depended on, both to determine, at once and with accuracy, the class of fibre or fibres that we are dealing with and the quantities of each, where two are mixed together. This can be done by a chemical analysis, that is, treating the cloth or fibres with acid or alkalies.

To detect cotton or other vegetable fibre in woollen or silk fabrics, one authority gives the following :—"Boil the sample to be tested in a concentrated solution of caustic soda or potash, and the wool or silk fibre will rapidly dissolve, producing a soapy liquid. The cotton, or other vegetable fibre therein, will remain undisturbed, even though boiling in weak caustic alkalies for several hours, care being taken to keep the samples below the surface of the solution during the operation. If, during this steeping process, it is exposed to the air, the cotton fibre becomes rotten, especially when the exposed portions are also, at the same time, brought under the influence of steam. (Any cotton fibres remaining from the testing, if coloured, may be bleached in chlorine water, and afterwards dissolved with cupra-ammonia.)"

Professor E. Kopp gives the following test :—"Wool is only soluble in cupra-ammonia by the aid of heat. Concentrated acids, such as sulphuric, nitric, or, preferably, hydrochloric, act in the cold upon silk, but not on wool. The dissolving properties of cupra-ammonia, on all vegetable fibres, make it one of the most reliable of tests. Cupra-ammonia is prepared by suspending strips of copper, in concentrated ammonia, in a large flask, tightly corked, and occasionally shaken, so as to bring the metal in contact with the oxygen of the air. By degrees, a tolerably concentrated solution of oxide of copper in ammonia is obtained, which dissolves cotton and other vegetable fibres, leaving animal fibres untouched."

Professor Hummel gives the following test for detecting silk from wool or the vegetable fibres :—"The best solvent for silk is an alkaline solution of copper and glycerine, made up as follows :—Dissolve 16 grains copper sulphate in 140—160 cc. distilled water, and add 8—10 grains pure glycerine (Sp. Gr. 1. 24) ; a solution of caustic soda has to be dropped gradually into the mixture until the precipitate at first formed just re-dissolves ; excess of NaOH must be avoided." This solution does not dissolve either wool or the vegetable fibres, and thus serves as a distinguishing test.

Another method is given as follows :—"Concentrated zinc chloride, 138° Tw. (Sp. Gr. 1·69), made neutral or basic by boiling with excess of zinc oxide, dissolves silk slowly, if cold, but very rapidly, if heated to a thick gummy liquid. This re-agent may serve to separate or distinguish silk from wool and the vegetable fibres, since these are not affected by it. If water be added to the zinc chloride solution of silk, the latter is thrown down as a flocculent precipitate. Dried at 230° to 235° F., the precipitate acquires a vitreous aspect, and is no longer soluble in ammonia."

In testing either cloths or fibres, where wool or silk is mixed with vegetable fibres, the better test is to use caustic soda, as this has less effect upon the vegetable matter than sulphuric acid would have upon the animal fibres—that is, if we subject a mixed yarn or cloth to the action of caustic soda, the soda would have, as shown in the above quotations, little or no effect upon the vegetable matter, while, on the other hand, if we treat it with sulphuric acid, there is a danger of the wool being affected by it, before the acid has entirely destroyed the vegetable matter, but it is best to be guided by the proportion of the two materials. If the cotton or vegetable matter predominates in the sample to be tested, it is better to use the alkali or caustic soda test, as it will destroy the wool or animal matter without disintegrating the sample, and thus allow the residue to be washed out without any fear of any of the vegetable matter escaping. On the other hand, if the animal matter predominates, better results would be obtained with the acid test, but, in using the acid, care must be taken not to have it too strong, or to allow it to boil very long, otherwise, some of the animal matter might be destroyed.

If the samples are undyed, the process is very simple, but, if dyed, the difficulties are increased, owing to the action of the acids used for mordanting, and the various colouring matters used in dyeing. These should be got rid of if possible, and, in most cases, subjecting the sample to boiling in a concentrated solution of hydrochloric acid will either remove the colour or render the material subject to the tests to be applied, but, after thus boiling, care must be taken to thoroughly wash away the acid and the impurities loosened by the process.

The method we should adopt in the case of dyed samples would be to boil, for two or three minutes, in the hydrochloric solution, putting the sample in while cold, so as to allow it to penetrate the sample, then, immediately, to thoroughly wash it and allow it to dry in a cool, airy place, after which we should carefully weigh it, and then subject it to either the acid or the alkali treatment, according to the above-mentioned rule. We should use about a 5% solution, and put the sample in while cold, and gradually raise the temperature to boiling point, and allow it to boil for two or three minutes, and then wash off and allow it to dry in a cool, airy place, so as to get it, as nearly as possible, the same temperature as before, when it is again carefully weighed, and the loss noted, and the percentage of loss calculated.

One method generally adopted is to dry the sample to be tested in a copper oven, heated by a bunsen burner to a temperature of 105° C., and then to weigh it and test it in the above manner, and, after washing, to evaporate the moisture, and dry to the same temperature before weighing, so as to ensure having the same amount of moisture on each occasion of weighing, but, when the sample is weighed at this temperature, it readily takes up moisture from the air in the process of weighing, and we find that, unless we get the accurate weight immediately, it will gain weight so quickly that, in the case of using a very small sample, our percentage of loss will be very far out. We should prefer (if the oven is used), to leave the sample in the air for a few minutes after drying, so as to get it the same temperature as the balance or scales would be, and then to weigh it. By this means, we could ensure getting the weight accurately, without it taking up moisture during the process of weighing.

Having stated at length the receipts and methods adopted by several authorities, we will give a complete analysis, as found by the above method, viz. :—drying the sample in a copper oven, and then allowing it to take up moisture from a room, at a temperature of 62° F. before weighing, and then subjecting it to the test, and again drying in the oven to evaporate the moisture, and allowing it to again dry in the air, before weighing it to ascertain the loss.

Weight of cloth = 8·0 grains.
After treating with the caustic soda = 2·67 grains, or 33⅓% cotton.
Wool dissolved in the process = 5·33 grains, or 66⅔% wool.

Warp weighed 1·14 grains.
After treating, ·40 grains, or 35% cotton.
Wool dissolved, ·74 grains, or 65% wool.
Weft weighed 3·4 grains.
After treating, 1·05 grains, or 31% cotton.
Wool dissolved, 2·35 grains, or 69% wool.

In the above example, there is either more wool in the weft than in the warp, or else some of the short fibres of cotton have been lost in the working, owing to there being less twist in the weft. If we take the warp and weft together, we find the proportion of cotton 32·2% against 33·5% in the cloth, so that there has evidently been a slight loss in separating the warp and weft from the cloth.—*Journal of Fabrics.*

THE NEW YORK BREWERIES COMPANY, LIMITED.—The directors of this company recommend a final dividend on the ordinary shares of 15s. per share (tax free), making, with the interim dividend already paid, 15 per cent for the year ending August 31.

WHITE LEAD AND ITS INVENTORS.

III.

SPECIALLY CONTRIBUTED.

(Continued from page 211.)

PROF. E. V. GARDNER in 1882 patented what he called an electrical process for the manufacture of white lead, which possesses some novel points. The specification of this patent, No. 731, of 1882, is quite an elaborate treatise on white lead. The conditions, which are most favourable to the production of white lead, are carefully pointed out much more elaborately than by any other patentee, these are the proper formation of subnitrate or subacetate of lead combinations of the normal nitrate Pb 2 NO_3, or the normal acetate Pb 2 C_2 H_3 O_2, with lead hydroxide Pb H_2 O_2; most other inventors consider the basic acetate or nitrate combination of the normal salts with lead oxide; a proper temperature, 120°–130° F. lower than this, increases the time required for their formation, much higher the subsalts lose their water of hydration. Too little air, acetic acid, and aqueous vapour prevents the formation of the hydrated subacetate, and consequently of the subcarbonate of lead. On the other hand, too much of these causes the formation of the neutral salts of lead which are washed off the lead and are lost. The patentee uses a chamber of any convenient form, but so constructed that the progress of the process is quite visible, a number of shelves are arranged on which are placed plates of carbon, or tin, or some other substance that is electro-negative to lead, a strip of metal connects one shelf with another, so that the shelves with the castings of lead form an electrical series. The lead is cast into buckles or gratings placed on the shelves, moistened with a solution of acetate or nitrate of lead, and then exposed to currents of vapours of acetic or nitric acid formed by passing currents of air through boiling dilute solutions of either or both those acids, the temperature of the chamber is kept at 120° F., and a moist misty atmosphere is kept in the chamber by careful regulation of the supply of steam and acid vapours for 48 hours, then carbonic acid gas as pure as possible—the patentee obtains it by the combustion of petroleum products—is passed in for two hours, then the acid gases alone are passed in for four hours, then the carbonic acid again for two hours, and so on for seven to fourteen days, when the blue lead will have been converted into white lead.

In a subsequent patent, Mr. Gardner makes use of the oxides of nitrogen, especially of the binoxide in combination with acetic acid, which he makes from nitric acid, and forces the mixture along with carbonic acid into the chambers by a blast of air, using a special form of plant for this purpose; he also places in the chamber tubs containing graphite, or tin, or other body electro-negative to lead, moistening these with acid, and connecting them with the blue lead by strips of metal.

The white lead produced by this process is quite satisfactory, of good colour and body, and closely approaches in quality the best Dutch lead. Whether the process is in actual operation on a large scale is not known to the writer, but he has seen samples of the lead produced by its means.

Mr. Smith patented a process in 1882 in which he uses lead in the form of spirals, formed by turning in a lathe, these are placed in a shallow chamber, resembling a gardener's hot bed, in trays of acetic acid, carbonic acid is passed in for months; what advantage this possesses over other processes is not stated and not perceptible.

Dr. Hand Smith, 1883, No. 5862, places lead, in a granulated form, in a jacketted chamber, and passes in air and carbonic acid gas saturated with moisture and acetic acid by passing through a 0·75% solution of acetic acid, the temperature of the chamber being kept at 120°–140° F., and the operation is conducted under pressure.

Schmoll, a little later in the same year, places lead on shelves in chambers, acetic acid vapours are passed in continuously, while carbonic acid gas, saturated with acetic acid, is passed in. Neither of the two latter processes present any novel features which would indicate that they are improvements on previous processes.

Haylor, Read and Percival's process, 1885, No. 13,115, seems to be but a variation of previous processes without being, apparently, any improvement thereon. The sole point of novelty seems to be the placing of a quantity of acetic acid in a depression in the floor of the chamber, the tube conveying the gases is passed into the centre of this, and into a distributing box through perforators, in the lower edge of which the gases are caused to pass through the acid.

Warwick patent, 1886, No. 5820, while not differing in the materials used, presents a novel form of plant used. This consists of a large circular chamber, in this is fitted a central revolving shaft carrying a number of shelves; between these moving shelves are other shelves fixed to the side of the chambers, scrapers attached to the shelves cause anything placed on them to travel towards the free edge, and the construction and arrangement of the shelves is such that anything put in at one end must take a very circuitous course before it passes out at the other end. Metallic lead in the form of a fine powder is fed in at the top end of the chamber and gradually passes through, coming at the same time into contact with carbonic acid, etc., it is gradually converted into white lead.

Morris, in 1888, patented a process which differs but little from previous ones, lead, in the form of wire or sponge, is placed on shelves in a chamber, on the floor of which is placed vessels containing acetic acid, by means of a blower a gentle current of carbonic acid is forced through the chamber, which is heated by steam, the carbonic acid that passes through the chamber is collected and again blown into the chamber. The novelty in this process is stated to be the use of acetic acid and carbonic acid in company, but this is not so, as many inventors before Morris passed these bodies in company.

Next to the Dutch process the chamber processes yield the best quality of white lead, but they require very careful regulation of the admission of the various gases to obtain satisfactory results, as has been pointed out when describing some of the patented processes; the problem is to produce an hydrated carbonate of lead, this can only be done when an hydrated salt of lead has been previously formed, and to do this necessitates the admission of acid, vapours, etc., in proper proportions, and at proper temperatures, too much acid causes the formation of normal salts which are practically useless, too much air and too little water results in the formation of oxide instead of hydroxide of lead, and this will not form good white lead; the temperature requires careful regulation, if too low the formation of the products is too slow, if too high the hydroxide is not formed, the margin is very slight, only about 20-30° F. between a correct and incorrect temperature.

The admission of the various acids, gases, etc., should be under perfect control, and they must therefore be introduced into the chamber from the outside, those processes in which vessels of liquid acid are placed inside the chambers cannot be considered very satisfactory.

The third group of processes for making white lead are rather numerous, and have as their underlying principle the action of carbonic acid on various salts of lead, neutral or basic. They differ one from another in the particular salt of lead used, and in form of plant in which the process is carried on. Between one and another of the inventors of these white lead processes, every available salt of lead has been used, with more or less, generally less, success.

The earliest patentee of these processes is Edward Moore Noble, 1808, who passes carbonic acid gas through an acetous solution of lead contained in a vessel. He also uses a solution of acetate of lead charged with litharge. This will not do more than give a precipitate of carbonate of lead, which is not what is wanted.

Following him came Maughan, in 1837. He takes oxide of lead, or a mixture of oxide and chloride of lead, mixes them into a paste with water, and passes carbonic acid through the mixture; when, so the patentee says, the lead will be converted into white lead. He says nothing as to how he prepares his mixture of oxide and chloride, and much depends on that. If a simple mixture, no white lead would be formed; if a molecular combination of the two compounds, probably the carbonate would be formed, but this product would not be satisfactory.

The same year Messrs. Bulton and Dyar patent a process, in which they use a basic nitrate of lead, made by boiling litharge or protoxide of lead with a solution of litharge, then passing through this solution a current of carbonic acid gas, prepared by the combustion of anthracite coal, and specially purified to free it from sulphuretted hydrogen. The gas converts the oxide into carbonate, leaving the nitrate unacted upon and ready to dissolve more oxide. This process is no better than the others just named.

In 1838 several patents were taken out; the first being by Edward Heard. This gentleman takes lead and melts it in a reverberatory furnace, with a certain quantity of nitrate of soda thrown in in small quantities at a time. In a few hours the lead resembles litharge in colour, which is by no means surprising, considering that it will have been converted into that body. The mass is allowed to cool; it is then ground to powder, mixed into a paste with water to the consistence of a thick cream, placed in a closed vessel, and carbonic acid gas passed in until all the protoxide of lead has been converted into carbonate of lead, which is separated, washed, and dried. The success of this process is rather doubtful. That carbonate of lead will be found is certain, but whether all the protoxide will be converted into carbonate is uncertain; and what is not so converted will be of a yellow colour, and will injuriously affect the tint of the resulting white lead.

Woolrich the same year patents a most novel process, that, however, may be said to follow on the lines of a still earlier patent granted to Torassa in 1833.

Both Torassa and Woolrich obtain lead in a very fine form by attrition of the lead itself in a revolving vessel, the friction of the pieces of lead one upon the other gradually (very) converts it into powder, Torassa exposes this to the action of the atmosphere (!) to

form the white lead, Woolrich, before grinding, moistens the lead with a solution of acetate or other salts of lead, then after grinding for twelve hours, separates out the mud which has been formed by water, and passes carbonic acid through the mixture. The economical aspect of this process is not by any means favourable, and there is no wonder it died a natural death.

However, in 1838, there arose an inventor, Dr. Horace Cory, who showed some inventive faculty in connection with white lead making; Cory uses basic acetate of lead and carbonic acid gas the same as Heard before him, a different form of plant being used. In Cory's process a large chamber is built, which is divided into compartments by partitions, which are so arranged that a current of carbonic gas passing in at one end of the chamber must pass through it in a sinuous course before it passes out at the other exit end of the chamber. On the top of the chamber is built a shallow tank with a perforated bottom, a solution of basic acetate of lead is run into this tank, and necessarily flows through the perforations into the chamber below in fine streams, here the solution comes in contact with carbonic acid gas, and the oxide it contains is converted into carbonate, this falls on the floor of the chamber, from whence it flows into settling tanks, the white lead settles out, is collected, and finished for sale. The liquor contains normal acetate of lead which is used over again for dissolving more litharge. Dr. Cory's white lead long had a good reputation for quality, and the process is still, it is believed, in use. Cory gives no details as to the strength of the basic acetate solution, and it is obvious, as will be pointed out later on, that much of the success of the process depends upon this little factor, probably, practical working soon showed what strength the solution was to be used at. Nothing seems to have been published as to the qualities and composition of this white lead, if these particulars could be obtained it would be a matter of great interest. The improvement in Dr. Cory's process was in the bringing of the materials together in a more intimate contact than had previously been done.

Chisholm aud Bellemoi's process (No. 7,895, 1838) is a replica of Heard's and is only of interest because proportions are given, namely, 30 lbs. of acetate of lead, 63 lbs. of litharge and 400 lbs. of water, this solution being kept at 165° F. while the carbonic acid gas is passed through it.

John Mullins some four years later, in 1842, took out a patent which covered, among other matters relating to lead and its salts, a most curious process for making white lead, which might act if used to make a solitary pound for experimental purposes and where cost is a secondary item, but when it comes to a question of tons, at the lowest possible cost, the economy of the process is doubtful.

The process consisted in stringing a lot of sponges together on a loosely plaited string, hanging these from a vessel containing basic acetate of lead, in a chamber into which carbonic acid flows from a generator, the capillary action of the string caused the sponges to be always moist with the liquor, and the carbonic acid converted the oxide of lead in this into carbonate of lead. When the sponges were loaded with this product they were taken apart, and the white lead collected. This reads more like a boy's experiment in chemistry than a manufacturing process.

Fourmentin, whose patent is dated 22nd May, 1847, uses the oxychloride of lead, made from oxide of lead and chloride of sodium, as a base for making white lead. The oxychloride of lead is mixed with water, placed in cylinders fitted with radial beaters, and heated to the boiling point, carbonic acid is now passed into the cylinders, until it is in excess, which is ascertained by boiling some of the liquid mass when carbonic acid should be evolved. The mass is now boiled with chalk equivalent in quantity to the salt used in the first instance, until the liquid after filtration gives no precipitate with sulphide of ammonium. The chalk by abstraction of carbonic acid probably basifies the carbonate of lead which has been formed; but it is doubtful whether this action is sufficient in amount to form the right quantity of hydroxide of lead that is required in good white lead.

Button, in 1837, used the basic nitrate of lead for making white lead; that the process was not satisfactory there cannot be any doubt, the nitrate being rather too stable a compound to be decomposed with sufficient ease by a feeble acid like carbonic acid; but still it possessed some attractions as is evidenced by the fact that Messrs. Brown and Young adopted it in 1858 as a starting point; they seemed, however, to be aware of the fact that carbonic acid alone is not sufficient to form white lead, so they modify the process somewhat. They use the normal nitrate, and pass carbonic acid into solutions of it until it is saturated, and then add caustic soda in excess; now this will cause a precipitate consisting partly of carbonate and partly of hydroxide, this precipitate is separated from the supernatant liquor and treated with lime water or milk of lime, the object of which is apparently to decompose a larger proportion of the carbonate into hydroxide, but whether it will do so is doubtful. The product is said to be pure white lead, but it is probable that it will contain traces of carbonate of calcium. This process appears to be able to give a better product than any of the others previously noticed. Much, however, depends upon the condition in which the white lead is precipitated, one great fault of all precipitation processes is the liability of the product being too crystalline in its character, which detracts very considerably from its body or covering power; very few patentees seem to grasp this fact, or to have taken steps to ascertain the best conditions of strength of solution, temperature of working, rate of formation, etc., to give a perfectly amorphous uncrystalline precipitate of white lead.

Mr. Thomas William Keates, in 1860, was evidently interested in the distillation of peat for the production of illuminating gas. Now the gas, as it comes from the retorts, contains some carbonic acid, which reduces its illuminating power. To free it from this, and yet to make the process profitable, Mr. Keates proposes to first pass the gas through ordinary oxide of iron purifiers, to free it from any possible sulphur compounds and then to treat it with a solution of acetate of lead, which takes up the carbonic acid and forms carbonate of lead or white lead, so the patentee says, but the doubt remains, is the white lead of sufficiently good quality in colour and body to make it marketable.

Following the example of Noble, Cory, and others, Ozouf, 1860, No. 1748, uses what he calls the neutral tribasic acetate of lead, but he carries on the process in a closed vessel fitted with agitators, and the carbonic acid is introduced under pressure, what improvement is thereby effected is not stated, and is not obvious.

(To be continued.)

CARBOLIC ACID MAKING.

NOW that caustic soda has advanced in price, users of the article are either endeavouring to use as little of it as possible, or to find a substitute in the shape of less expensive materials.

This is the case with most tar distillers. When caustic soda could be purchased for £6. 10s. per ton, the lime and sulphate of soda process of Messrs. West-Knights and Gall was not sufficiently tempting to secure its adoption; but caustic soda having risen to £10. 10s. and £12. 10s. per ton, has caused most of the keener men of business to open their eyes with astonishment.

Lime can be purchased for as many shillings per ton as caustic soda costs pounds, and this is the base used in the process of Messrs. West-Knights and Gall, together with the waste sulphate of soda liquor, now run away to the detriment of the drains, and becomes a source of river pollution.

The process of Messrs. West-Knights and Gall consists in adding lime in definite proportion to the waste carbolic acid liquor, and using the mixture to decompose a fresh batch of light oil (carbolic oil), whereby sulphate of lime and soluble carbolate of soda are produced, which is settled, and the clear liquor treated by acid in the usual way to throw up the carbolic acid, reforming the sulphate of soda liquor, which is used over and over again.

The pecuniary result is a saving of from fourpence to fivepence per gallon on the carbolic acid made, with the further advantage that no carbolic acid is lost in the acid water, producing a better yield, while there is no waste water to trouble the tar distiller to get rid of.

The plant is very simple, and the old apparatus can easily be adapted to the new process. The method of working and plans of plant required for the same may be inspected at the Manchester Technical Laboratory.

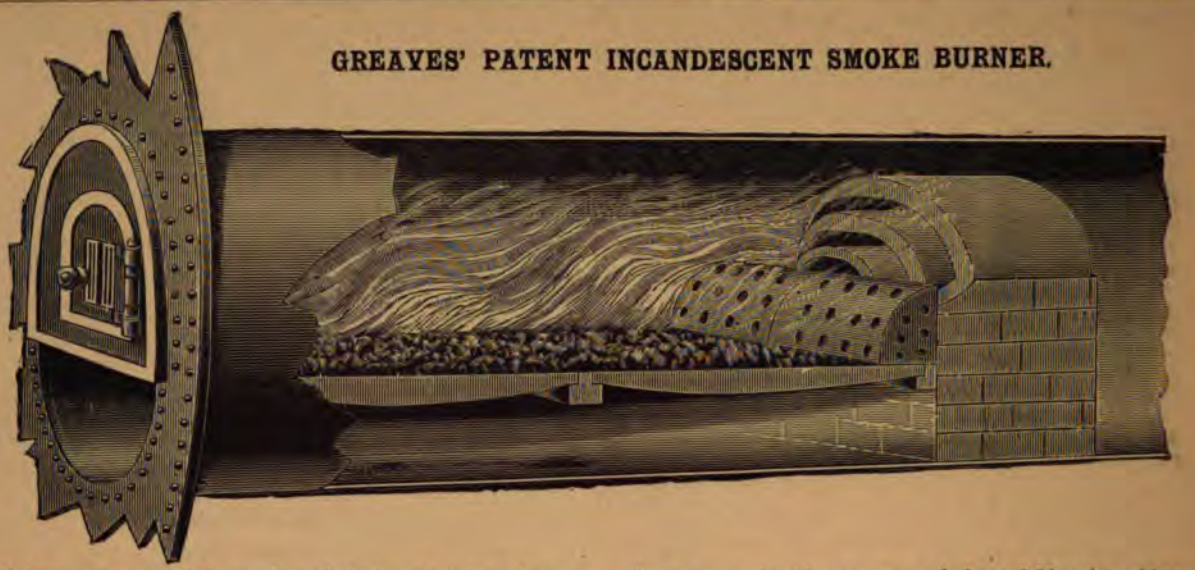
THE EXTRACTION OF COPPER.

TWO separate streams of cuprous chloride dissolved with common salt in water are supplied to the anodes and cathodes, separated by a suitable diaphragm, of an electrolytic bath or a system of such baths. The anodes are best made of carbon, the cathodes of copper plate. Any silver and the copper present in the solution are deposited on the cathode, one ampère giving 2·36 grms. of copper per hour, twice as much as in the electrolysis of copper sulphate. At the anode, the cuprous chloride is converted into cupric chloride, which is then again reduced to cuprous chloride by allowing the liquid to act upon sulphide of copper ores:

$$CuCl_2 + CuS = S + 2CuCl.$$

The liquid coming from the cathode, which has now become free from copper or poor in copper, is mixed with that from the ores, so that the strength suitable for electrolysis is, as far as possible, maintained. This solution is then employed exactly in the same manner as before, copper being removed from it at the cathode, whilst at the anode the cuprous chloride is converted into cupric chloride, and this again employed to extract the ores, etc., etc., as before.—*C. Hopfner, German Patent No. 53,782.*

GREAVES' PATENT INCANDESCENT SMOKE BURNER.



A FEW days ago, we availed ourselves of the inventor's invitation to see this appliance at work at the Egret Mills, Ashton-under-Lyne. Two boilers, each 30 ft. by 7 ft., are there fitted up with the Incandescent Burners, but only one was in operation at the time of our visit. Fine slack of a very common quality was the fuel used—with ordinary hand firing—and no additional fittings or mechanical contrivances were present to complicate the question or increase the difficulties of its solution.

Mr. Greaves' patent is so simple as almost to require no description, and the fact that its introduction is of so recent date only affords another illustration of the truism that, the most simple things require the most finding out. It consists of one or more blocks of segmental form, curved so as to be concentric with the shell of the boiler fire flue, and arranged upon the bridge at the back of the furnace in the manner shown in the illustration. The blocks, which are made of a special material, have much the appearance of ordinary refractory fireclay ware, the chief points aimed at in their composition being a low heat conducting power, and a highly refractory nature. Within from half an hour to an hour from starting the boiler fire, the blocks have arrived at an intense heat or incandescence—hence the name—and from this point commences the discharge of their functions as preventors of smoke.

It is well known that each new addition of fuel to a boiler fire is followed by the immediate evolution of large volumes of combustible hydrocarbon vapours, and that under ordinary circumstances a very large proportion of these vapours passes away unconsumed into the air in the form of smoke—for the simple reason that they are removed too soon from the neighbourhood of the glowing coals, where, and where alone, the heat is sufficient to allow of their combustion. This defect the Incandescent Smoke Burner remedies in a very effectual manner by supplying a supplementary highly-heated surface so disposed that the escaping hydrocarbon vapours are forced to come into contact with it, and by such contact are heated to the temperature necessary for their perfect combustion. Of course, it may happen that combustible gases escape unburnt from another reason, viz., a deficiency of oxygen, and bearing this in mind, Mr. Greaves introduces, where circumstances require it, a supply of air at the rear end of the furnace grate in addition to that which finds its way through the furnace bars. This supplementary air supply is admitted by means of perforated curved blocks placed just in front of the bridge, as shown in the illustration.

With regard to the capabilities of Mr. Greaves' invention as a smoke preventor we can speak with authority, for we saw a good many firings take place, and in no single instance was any black smoke emitted from the chimney top. Each time there was a light greyish brown appearance for from half a minute to a minute, but we saw nothing worse than this during the whole of our stay. The success was the more noticeable, as some of the neighbouring chimneys were belching forth such huge volumes of dense black smoke as should be tolerated in no civilised community. To us this was the crucial test, but the inventor claims further an economy of fuel and improvement of draught, as shewn by the following tabulated results of tests carried on by Mr. E. G. Constantine. M I.M.E., on the 3rd and 5th proximo.

	Sept. 3rd with Ordinary Furnace.	Sept. 5th with Patent Smoke Burner fitted.
Duration of Test .. . ..Hrs.	4½	4½
Description of Coal	Wath Main Colliery	Wath Main Colliery
State of Weather	Light Wind, rainy	Light Wind, fine
Temperature of Air in Stokehole deg. F.	62·25	63·75
Do. Feed Water .. do.	54	54
Velocity of Air entering Ash-pits .. .. .. Ft. per min.	Right, 865·5 Left, 955·5	Right, 659 Left, 590
Area of Grate Surface Square feet	39	34·8
Total Weight of Fuel burnt .. lbs.	2,789	2,178
Do. do. Ashes produced .. do.	247	79
Percentage of Ashes produced ..	8·8 per cent.	3·6 per cent.
Total weight of water evaporated .. lbs.	19,000	17,400
Weight of Fuel burnt per hour .. do.	619·7	484
Weight of Water evaporated per hour do.	4,222·2	3,886·6
Weight of Water evaporated per lb. of Fuel at 54 deg. .. .. .. do.	6·81	7·08
Equivalent Weight of Water evaporated per lb. of Fuel at and from 212 deg. .. .. do.	7·9	9·28
Weight of Water evaporated per lb. of Combustible at and from 212 deg. .. .. do.	8·69	9·71
Weight of Fuel burnt per square foot of fire grate area, per hour .. do.	15·8	13·9
Quantity of Water evaporated per square foot of fire grate area cubic feet	1·72	1·77
Smoke.—Emission from Chimney per hour—		
Light .. .. ..mins. secs.	19 0	8 10
Brown .. .. .. do. do.	9 15	1 17
Black .. .. .. do. do.	4 15	0 32
Flue Gases.—Temperature ..degs. Fah.	385	230
Carbonic Acid ..	7·1 per cent.	9·9 per cent.
Do. Oxide ..	Nil.	Nil.
Oxygen	2·5 per cent.	9·6 per cent.
Gain in Evaporation lbs. of Water per lb. of Fuel by adopting Smoke Burner	17·4 per cent.	
*Gain in Evaporation lbs. of Water per lb. of Combustible	11·7 ,,	
Reduction of Smoke by adopting Smoke Burner—		
Light	57 ,,	
Brown	83 ,,	
Black	91 ,,	

* After deducting ashes from coal.

LARGE PETROLEUM TANKS.—The Widnes Foundry Co. have just completed some petroleum tanks for the Mersey Dock and Harbour Board, one of which, we believe, is the largest petroleum tank ever made. It is 74 feet in diameter and 32 feet deep, and the first time it was filled with water it was passed by the Dock Board engineer. We notice that the Widnes Foundry Co. are now open to undertake the erection of these tanks anywhere.

THE BOMBAY GAS COMPANY, LIMITED.—The report of this company for the half year ending June 30, states that the gas and meter rental shows an increase of £1,385. The balance at credit of general revenue account (after placing £2,000. to reserve fund) was £9,053., out of which the directors have declared an interim dividend of 3½ per cent. (tax free) for the half-year, payable on December 1, and leaving £653 to be carried forward.

THE ESTIMATION OF ALUMINA.

By M. Kretzschmar.

ALTHOUGH the determination of alumina is not attended by any special difficulties, it is, nevertheless, a tedious process, and it would be of great advantage to replace the lengthy operation of filtering and weighing the precipitate of alumina by some volumetric method of estimation. When a solution of alumina is converted into the acetate, and the alumina precipitated by excess of sodium phosphate, the phosphoric acid which remains uncombined with alumina can readily be estimated by titration with uranium solution, the precipitate being disregarded. Various reasons have prevented this method from being adopted in practice. In the first place the ferrocyanide reaction is usually given before all the phosphoric acid is precipitated, and the results thus become unreliable. The determination requires a large number of uranium titrations and the saving in time thus becomes almost illusory; moreover the precipitate of alumina is by no means insoluble in ammonium salts.

Notwithstanding these difficulties it is possible to obtain very satisfactory results by fulfilling certain conditions: All ammonium salts must be avoided, an excess of sodium phosphate must be added at once and in the cold, and the uranium solution must be standardized by titration against an aluminium salt of known composition. The strength of the uranium solution cannot therefore be determined, as usual, by means of calcium phosphate (superphosphate free from iron).

The uranium solution is made up, as usual, by dissolving 175 grms. per litre of uranium acetate (not nitrate). Its strength is then determined by means of sodium ammonium phosphate, the absolute purity of which has been determined by quantitative analysis (14·718 grms. to the litre); the solution of uranium is then diluted so that 1 c.c. corresponds to about 0·004 grms. P_2O_5.

Ten grms. of pure potash alum, free from iron, are dissolved in water, the solution converted into one of acetate by the addition of sodium acetate and a little acetic acid, and diluted to 500 c.c. 50 c.c. of this liquid are mixed with 10 c.c. of the usual sodium acetate solution and an excess of sodium ammonium phosphate solution, the strength of which has been previously found by titration with uranium. The liquid is then heated to boiling and titrated with the uranium solution (several titrations are made until the amount required is known within a few tenths of a c.c. and the final titration then effected), the number of c.cs. required being noted.

It is always well to make a special gravimetric determination of the alumina in the alum, since even the smallest crystals of the latter not infrequently contain cavities filled with water. This is best carried out in the following way, the precipitate obtained being more easy to filter than that produced by ammonia.

An excess of sodium phosphate and a little sodium acetate are added to 50 c.c. of the alum solution and the precipitate dissolved in dilute hydrochloric acid. The solution is then heated to boiling, a concentrated solution of sodium thiosulphate added in large excess, and the liquid boiled until the precipitate immediately settles down when the beaker is removed from the wire gauze, care being taken that the boiling is not continued beyond this point. The precipitate is then filtered off, washed with hot water, dried and ignited, air being admitted towards the close of the ignition. The weight of aluminium phosphate multiplied by 0·4204 gives the alumina. The addition of sodium thiosulphate is not intended to reduce any iron which may be present, but simply to obtain a precipitate which can easily be filtered and washed. Errors of weighing are much diminished by the low factor which is used and the determination is very accurate. The results of the two processes (gravimetric and volumetric) should not differ by more than 0·15% in the quantity of alumina found. This degree of accuracy can always be obtained when the same volume of liquid is used (60–70 c.c.) in titrating the alum and standardizing the solution by sodium phosphate. The strength of the uranium solution is now calculated from the result of the gravimetric analysis, and this value taken as the true one.

To simplify the application of the method, and avoid the wearisome repetition of the titrations, the salt of aluminium may be first simply titrated with caustic potash solution and methyl orange, as indicatory, until the pink colour disappears; phenolphthaleïn is then added, and the titration continued until a permanent violet is produced. The number of c.c. required to neutralize the acid present is given by the result of the titration with methyl orange, and is subtracted from the total amount of caustic potash used, thus leaving the amount necessary to decompose the aluminium salt, from which the percentage of alumina can be roughly calculated. In this way the amount of uranium solution to be added can be ascertained within 2 c.c., and the titration of the phosphoric acid can therefore, after a little practice, be completed in one experiment. As it is usually necessary to determine the acid present, this preliminary estimation of alumina scarcely involves any additional labour, the titration of the acid being simply continued. Very few and unimportant modifications suffice to meet all the cases which actually occur in practice. Solutions of ammonia alum are boiled with a little caustic soda until practically free from ammonia, etc.

An analysis of a very impure ferruginous sulphate of aluminium may serve as an example. 5 grms. of this were dissolved in 500 c.c. of water, the acid determined in 50 c.c. by caustic potash and methyl orange, and the amount of alumina roughly found by further titration in presence of phenolphthaleïn. A second quantity of 50 c.c. was boiled with a few drops of a solution of bromine in hydrochloric acid. On cooling, sodium acetate and acetic acid were added, then a known volume of sodium phosphate solution, and the alumina determined by a single titration. The iron is estimated by reducing 50 c.c. with zinc and dilute sulphuric acid, and titrating with permanganate, the ferrous iron being if necessary determined by titrating the original solution with permanganate. The equivalent in alumina of the total ferric oxide found must be subtracted from the alumina found by titration, the remainder being the amount of alumina present. Solutions of aluminium sulphite should be converted into sulphate by the action of bromine water.—*Chemiker Zeitung.*

Legal.

QUEEN'S BENCH DIVISION.

(*Before* Mr. Justice Charles.)

THE THARSIS SULPHUR AND COPPER COMPANY V. LA SOCIETE DES METAUX.

THIS was an action brought to recover the sum of £59,186., being damages for breach of contract to accept delivery of and pay for certain quantities of copper.

Mr. Gorell Barnes, Q.C., and Mr. Houghton appeared for the plaintiffs; and Mr. Kennedy and Mr. H. Tindal Atkinson for the defendants.

This case was one of several which arose out of the breakdown of the French combination known as the "Copper Ring" last year. Most of the questions, however, which arose in it had been decided in previous actions brought in the English Courts against the same defendants. The plaintiffs were an English company incorporated under the Companies Act, and the defendants were a body of persons incorporated in France. On April 20th, 1888, a contract was made between the parties by the exchange in London of duplicate parts thereof, one of which had been executed by the plaintiffs in Glasgow and the other by the defendants in Paris. By the contract the defendants agreed to purchase at prices therein named all the refined copper manufactured by the plaintiffs during three years, commencing January 1st, 1888. In March, 1889, the defendants went into liquidation. By the terms of this contract, the defendants elected domicile in this country. The amount now claimed by the plaintiffs was the deficiency arising upon re-sales of the copper of which the defendants had not taken delivery under the contract. The defendants pleaded that, the contract having been executed by them in Paris, was a French contract and subject to French law; and consequently was illegal and void, inasmuch as it was contrary to Article 419 of the Code Pénal, which, it was alleged, rendered a combination such as this, to affect the price of goods, illegal. Further, that by the French law of liquidation the plaintiffs could not rescind the contract and recover damages; but could only exercise a right of election between rescinding the contract (without damages) and delivering the copper and proving in the liquidation for the price. The plaintiffs admitted that the last statement was a correct one of the French law on the subject, but denied the alleged illegality, and contended that the contract was an English contract, and was therefore unaffected by French law. In the case of "Antony Gibbs and Son v. La Société des Metaux" (6 *The Times* L.R., 393) the Court of Appeal, upon similar facts, held that the right to sue on an English contract was not affected by the French law of liquidation, and in "Cape Copper Company v. Comptoir d'Escompte and La Société des Metaux" (6 *The Times* L.R., 454) Mr. Justice Day held that similar contracts were English contracts, and that the rights of the parties were therefore to be determined according to English law.

Mr. Justice Charles said that, although some of the facts as to the execution of the contract in this case were different to those in the cases referred to above, yet he had come to the conclusion that the contract was an English contract, and that his duty was to follow the judgment of Mr. Justice Day in the other cases, which proceeded on the ground that the parties themselves had agreed that the contract should be subject to English law, and that it was to be performed (and, until the liquidation, had been performed) within the jurisdiction of the English Courts.

Judgment was accordingly given for the plaintiffs, with costs; the damages to be agreed between the parties, or, in case of difference, to be settled by the Judge.

NOTICE.

WE have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

October 7th.—"Manufacturing Smoke."
November 4th.—"Domestic Smoke."
December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the second Lecture, on November 4th—"Domestic Smoke"—the chair will be taken by Dr. A. Ransome, M.A., M.D., F.R.S., Lecturer on Hygiene at the Owen's College. The lecture will be illustrated by experiments.

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

THE TESTING OF LIGHT PETROLEUM.

R. KISSLING, having occasion to examine annually a large number of samples of light petroleum, has adopted the method of testing described below. The fractionating flask used is of the form and size recommended by Engler. One hundred c.c. of the petroleum sample are measured into the flask, which is connected with a Liebig's condenser 60 cm. long. The flask is supported by a thick piece of wire gauze, such as is used in the filter presses of sugar refineries. The distillate is received in a cylinder graduated to 0·5 cc. It is advisable, at the commencement of distillation, to make the end of the adapter dig pretty deeply into the cylinder, in order to avoid loss by evaporation of the low boiling fractions. The rate of distillation is such that 2 to 2·5 cc. are driven over per minute. When the heat is first applied, the mercury in the thermometer rises rapidly, then more slowly, and next becomes stationary for a while; the last position marks the "lower limit" of the boiling point of the sample. The distillation is now carried on, readings of the volume distilled being taken at intervals of 10°, beginning with the lowest multiple of 10 above the "lower limit." Finally, when the flask has become very nearly empty, the full flame of the Bunsen burner is directed to the bottom of it, and the temperature of the thermometer noted, this temperature being the "higher limit." It is not necessary to drive over the last few drops in the flask, but should it be desirable to do so, the thermometer should be lowered to the level of the bottom of the neck of the flask. In the following table there are shown some results obtained by this method:—

	Kind of Petroleum.			
	Gasoline (petroleum ether).	Light benzene.	Middle benzene.	Heavy benzene.
Boiling points guaranteed by vendor, deg.	30—100	60—100	80—120	100—130
Volume (in cc.) distilled,				
30°	0	....	....	....
Ditto 40°	37	....	....	....
50°	66	....	....	....
60°	81	0	....	....
70°	95	53	....	....
80°	97	89	0	....
90°	97·5	96·5	59	....
100°	98	97·5	98	0
110°	....	98	98·5	67
120°	....	98·5	99·0	94
130°	....	....	....	99
Lower limit, °	31	62	80	101
Higher limit, °	121	123	119	138
	(98·0 %)	(99·0 %)	(99·0 %)	(99·5 %)

Correspondence.

ANSWERS TO CORRESPONDENTS.

A.Z.—One of the tricks of the trade. We may have something to say on the subject shortly.

CALORIE.—It depends on the merits of the article. We cannot say we will insert it until we have seen it.

A.P.L.—You will see we have noticed the article in this number.

O.P.Q.—The albumenoid ammonia is very high indeed.

*** *We do not hold ourselves responsible for the opinions expressed by our correspondents.*

CAUSTICISING RECOVERED ASH.

(To the Editor of the Chemical Trade Journal.)

DEAR SIR,—In reply to your correspondent, "W. Y.," on his query as to the evolution of gas in causticising recovered ash and the nature of the gas given off, I have myself frequently noticed the phenomenon in the laboratory, though not as an invariable occurrence.

The fact which first drew my attention to the point was the marked decrease in the percentage of sulphide in the causticised liquors, as compared with the uncausticised ash.

Being at a loss to account for this fact at the time, I afterwards noticed the evolution of gas during the process of causticising, and finally concluded that a reaction analogous to that now utilized in Chance's sulphur recovery process took place, viz., some of the carbon dioxide liberated by the reaction of the lime on the carbonated ash, attacked the sulphide, liberating sulphuretted hydrogen, according to the equation:—

$$Na_2S + H_2O + CO_2 = H_2S + Na_2CO_3.$$

The remark of your correspondent to the effect that the gas he collected seemed to be hydrogen, would appear to confirm my supposition, since I presume the inference of hydrogen being present was based on the inflammability and characteristic flame of that gas.

But sulphuretted hydrogen also burns with a pale-blue lambent flame forming water (and sulphur dioxide). Should "W. Y." have the opportunity to test the gas, with a strip of paper moistened with lead acetate, the point would be easily and definitely settled. I shall do so myself on the first opportunity I have of collecting some of the evolved gas.—I am, &c.,

October 27, 1890. W. E. N.

Trade Notes.

THE CHEMICAL UNION.—The Chemical Union was to have been registered at Somerset House on Thursday, but owing to a technical difficulty the registration had to be deferred for several days longer. The capital of the company is to be, according to the proof prospectus, 8½ millions sterling, 7 millions being set against works, plant, land, and buildings, the balance representing stocks and working capital. Forty-eight firms (over 90 per cent. of the trade) have joined the Union.

THE MAKING OF KELP.—One of the industries which help the people in the Irish coast districts to eke out a subsistence is the making of kelp for iodine. For this they use the May weed, which grows very deep, and is usually washed by storms on to the numerous islands off the coast. When it has not drifted in this manner, they go out with long poles 14 or 15 feet long, having a hook or scythe blade at the end, with which they cut the weed and bring it in to dry. They then burn it in small rough kilns, heaping on the weed till it becomes a molten mass, which they stir up with iron rods, and then let it cool, putting in slates to divide it into blocks large enough to lift. They then put it in their boats and bring it to the store for sale, the present price being from £3. to £3. 10s. a ton. The collecting of Carrageen moss is another great industry in summer. The women and children gather it on the shore, bleach it, and sell it to the storekeepers, who send it away. It realizes about 4s. 6d. a cwt., but is very light, the exports during the last twelve months from Burton Port, which is the port of the Rosses, being 18 tons 19 cwt., nearly all of which was sent away during the summer months. Most of it goes to Belfast, where it is used for stiffening linen, but it also serves as an article of diet, and makes excellent puddings.

BACKUS AND JOHNSTON'S BREWERY COMPANY, LIMITED.—The directors of this company have declared an interim dividend of £3. 10s. per share (less income-tax) payable November 6, for the six months, ending June 30.

THE SCOTTISH AUSTRALIAN MINING COMPANY, LIMITED.—This company, in their report for the six months ending June 30, propose a dividend at the rate of 10 per cent. per annum (tax free), carrying forward £2,935. The dividend will be payable on November 8.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

The position of alkalies all round is firm. Soda ash in all qualities is is in good demand, and 1⅜ per per deg. f.o.b. is the general quotation for ordinary qualities of lebanc, and ammonia ash 48% to 58%. For some brands higher prices must now be paid, and all makers are well engaged with orders. The same firmness characterises also soda crystals and bicarbonate, the latter being considerably dearer. In caustic soda there is again a tendency to advance, but prices on the spot are nominally as quoted last week. All makers are well engaged with orders. Bleaching powder firm at £5. 15s. on rails, and £6. £6. for November-December delivery. Sulphur scarce, all the works being fully engaged to the extent of the present output—price in bulk £4. 2s. 6d. to £4. 5s. at makers works. Vitriol only obtainable in limited quantities at higher prices. Muriatic acid without change. Sulphate of copper without demand, and prices nominally £18.15s. to £19. Tin, lead, and zinc salts firmer generally. Rather more firmness in brown acetate of lime for early deliveries. Carbolic acid crystals dull, and without change in price. The demand continues good for potash caustic and carbonate, and prices are steady. Prussiate of potash firm at 9¼d. to 10d. Bichromates without change in value.

TAR AND AMMONIA PRODUCTS.

Benzol is still very firm, though there seems to be but little response from consumers to the high prices which are now asked and spoken of. Prices may be quoted as follows:—4s. 7d. to 4s. 7½d. for 90's, and 3s. 7d. for 50/90's. Solvent naphtha and creosote still remain firm. There is no change to report in anthracene, which remains at 1s. 6d. for 30% A and 1s. 2d. for 30% B, though perhaps odd parcels of the latter could be bought at a trifle less. The pitch market has hardened, and 33s. to 35s. at various ports may be quoted as to-day's price, though we do not hear of any business having been done at the higher figure.

The sulphate of ammonia market has become somewhat depressed under the influence of the collapse of nitrate. Cargoes of nitrate have receded in value about 6d. per cwt., and spot prices are correspondingly easy. The consequence is that consumers are not inclined to operate, and dealers, having supplied their October requirements, are looking on in the hope of lower prices. Beckton still maintains its price at £11. 12s. 6d., though London outside makes have fallen to £11. 11s. 3d. The price at Hull does not exceed £11. 10s.; and we hear there are sellers at £11. 8s. 9d. At Leith £11. 7s. 6d. to £11. 8s. 9d. is obtainable.

REPORT ON MANURE MATERIAL.

The depression in the market, which we referred to in our last report, has been continued throughout the week, and prices are again easier both for phosphatic and nitrogenous material.

Quotations for mineral phosphates remain very much the same as last reported, but they do not lead to business, and with prices of other materials declining, buyers are not anxious to make further purchases of mineral phosphates, unless considerable inducement is offered. 11d. per unit is still quoted for hot-air dried-bull river rock, in cargoes, c.i.f. to U.K., but land rock may be had at about 1d. per unit less. There are sellers of 70% Canadian phosphate at 1s. per unit, ⅛ rise, full delivered terms, and 13½d. per unit, same terms, would probably buy 75%.

There are several cargoes of River Plate bones offering at £5. 10s., but buyers are not to be found at the price. Considerable sales of East Indian bone meal have been made, to arrive and for shipment, on private terms, but it is understood that as low as £5. 10s. has been accepted, and this price would now be business. Crushed East Indian bones would not now fetch more than about £5. 5s. or £5. 7s. 6d. per ton, ex quay, and we should call £4. 17s. 6d. to £5. the nearest value for common grinding bones, in bulk, ex quay Liverpool. We do not hear of any business in bone ash, but price is still nominally £5. 7s. 6d. on 70%, nett, Hamburg conditions, delivered U.K. or Continent.

Nitrate of soda is again easier, and spot price cannot be quoted at over 8s. for ordinary quality and 8s. 3d. for refined. Due cargoes are worth about 8s. to 8s. 1½d. per cwt., and October-November's, say, 8s. 3d. to 8s. 4½d., according to size.

Some further sales of River Plate dried blood have been made at 10s. 3d. per unit, ex quay Liverpool, but this price could hardly be obtainable for further quantity.

Superphosphates remain very firm at 50s. per ton, in bulk, f.o.r. at works.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron: Scotch warrants closed at 51s. 8d. cash, and 52s. one month. Middlesbrough, 48s. 2d. cash; hematite, 58s. 9d., cash. Copper steady. Chili bars, G.O.B.'s and G.M.B.'s closed at £58. 17s. 6d. to £59. 5s. cash, and £59. to £59. 7s. 6d. three months. Tin was dull: Straits closed at £98. 15s. to £99. cash, and Straits, three months, £97. to £97. 10s. English ingots, £100. 10s. to £101. Lead firm; Spanish, £14. 5s. to £14. 10s. English, £14. 15s. Spelter firm; Silesian, ordinary, £25. to £25. 5s. Quicksilver, £10. first hand; £9. 18s. second hand. Copper shares: Mason and Barry, 7 5/16 to 7¼.

GLASGOW, WEDNESDAY.—The pig iron market opened strong, a fair business being done at 51s. 1½d., 51s. 1d., 51s. 5d., and 51s. 3½d. cash, and 51s. 4½d. 51s. 8d. and 51s. 6½d. one month; buyers 51s. 3½d. cash, sellers 1d. more. Middlesbrough warrants: Buyers 48s. cash, and 48s. 3d. one month; sellers 1½d. more. Hematite done at 58s. 2d. cash, and 58s. 5½d. to 58s. 9d. one month: buyers 58s. 5½d. cash, sellers 58s. 6d. In the afternoon the market improved, a good business being done at 51s. 5½d. to 51s. 7½d. cash, and 51s. 8½d. to 51s. 10½d. one month; buyers 51s. 7d. cash; sellers ½d. higher. Middlesbrough warrants done at 48s. 3d. cash, buyers 48s. 2d. cash, and 48s. 5d. one month, sellers 1d. more. Hematites done at 58s. 7d., 58s. 5½d., and 58s. 9½d. cash, and 58s. 8½d. to 59s. one month; buyers 58s. 8½d. cash, sellers 58s. 9d.

WOLVERHAMPTON, WEDNESDAY.—The quietude in the pig iron trade continues, but as there is enough work in hand to last some little time, no serious apprehension is felt. New business is coming in only slowly and in small lots, and although sellers of best qualities are keeping to their recent quotations, vendors of second and third rate sorts seem inclined to make concessions. The reports brought to 'Change this afternoon showed that current transactions are rather of a hand-to-mouth character. For all-mine hot blast 70s. to 75s. is still demanded, but part-mines can be obtained at about 46s. 6d., and cinder sorts are offered at 42s. 6d. to 45s. Steel makers report themselves busy, steel sheets being in good demand. The finished iron trade is unaltered on the week with regard to quotations, and there continues to be a fairly good demand.

THE LIVERPOOL MINERAL MARKET.

Minerals have continued fairly brisk during the week, and with few exceptions there is little alteration to report in prices. Manganese: Arrivals are very small, stocks have been somewhat reduced, and prices are firm. Magnesite: Stocks still excessively large, and with few sales. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £11. Bauxite (Irish Hill brand): The demand has continued to increase, and although the production is in full swing it can scarcely keep pace with the requirements; lump, 22s.; seconds, 18s.; thirds, 14s.; ground, 35s. French chalk: Arrivals this week are very small, whilst the demand has largely improved and increased. Sales have been made at full prices, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate very much easier; sulphate strong, and prices firm; "Angel White," No. 1, 70s; No. 2, 60s to 65s; No. 3, 45s. Pumicestone: No alteration to report in lump; ground easier. Iron ore: Native production in fair demand, and brings full prices, also Spanish and Bilbao; manganiferous in special request at good figures. Santander, 9s. to 10s. 6d., f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore steady. Emerystone: Stocks of best brands low, prices firm at—No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal continue in fair request

at full prices. Chrome ore: The demand has somewhat improved, especially for higher grades; prices firm. Antimony ore and metal maintains the strong demand at full prices. Asbestos in strong demand, especially Canadian rock. Potter's lead ore: "standard" brands in request; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Good qualities in demand at advanced prices. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in demand at 50s. (ground). Felspar and fluorspar, steadier. Plumbago: Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay: Steady; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), firm, finest quality, 22s.

THE LIVERPOOL COLOUR MARKET.

Colours rule steady. Ochres: Oxfordshire, common, £10, medium, £12., best, £15.; Derbyshire, common, 40s., medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The report last week that the Scottish Mineral Oil Companies were to be bought up by a large and wealthy English syndicate, turns out to be a mere stock market ruse, for the momentary raising of certain share values. The companies themselves announce that they have not of late been approached with any proposals of the kind, but it is true that about two years ago an effort on the part of some London financiers was made to this end, but failed of sufficient welcome in Scotland to induce any great perseverance. These companies just now are fairly prosperous, and paraffins in all sections except that of burning oil are very strong and carrying gratifying market value. There has been a great run on 865° lubricating for continental shipment, certain coming fiscal changes over favouring the storing of stocks to an unusual degree. In Scotland, the general chemicals market is rather lethargic at the moment, for the most part because of doubt as to the effect of the completed union, now all over accepted as an accomplished matter from November 1st. Caustic is easier again, and some second hand parcels are said to be obtainable at less than union figures. Bleaching powder is very firm locally, but not much changing hands. Bichromates have been rather idle, and the orders in hand are below the average. The market for sulphate of ammonia is languid and hardly anything doing. Probably it has been done down to £11. 7s. 6d., f.o.b. Leith, but this is not fully verified. Certainly, just now, sellers could not get more. Chief prices current are: Soda crystals, 56s. 6d. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 7½%, Tyne; caustic soda, white, 76°, £13. 5s., 70/72°, £11. 5s., 60/62°, £10. 5s., and cream, 60/62°, £9. 15s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £7., and 1 cwt. casks, £7. 5s., net Tyne; refined alkali, 48/52°, 1⅜d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, to £6. less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5¼d., less 5% any port; nitrate of soda 8s. 4½d. to 8s. 6d.; sulphate of ammonia, £11. 7s. 6d. to £11. 8s. 9d. f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £19., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb; paraffin wax, 120°, semi-refined, 3⅝d. to 3¾; paraffin spirit (naphtha,) 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 26,471 bags.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market has been firm during the past week, although there has been little new business transacted, makers being occupied principally with shipments on old contracts. The market quotations to-day for bleach ash and sulphate are below "Union" prices, but for delivery beyond the 1st November, makers ask the full figure. Preparations are being made in the various works for a general stock-taking on behalf of the Chemical Union, to commence on Saturday morning first.

Bleaching powder, in softwood casks, spot parcels, £5. 10s. per ton, Nov.-Dec. £6. per ton, hardwood casks, 5s. per ton extra. 77%, caustic soda, for delivery to end of year £12. 10s. per ton; ground and packed in 3-4 cwt. barrels, £15. 10s. per ton. Soda ash, 48/52%, 1⅜d. per degree less 7½% for spot and 1⅜d. less 3½% to end of December; soda crystals, 56s., prompt, and 56s. 6d. per ton Nov.-Dec.; sulphate of soda, in bulk, 35s. for prompt, 40s. per ton to end of year; recovered sulphur, packed in 2 cwt. bags, December delivery £4. 10s. per ton; chlorate of potash, 5½d. per lb.; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

The market for Durham small coal is firm at previous quotations. Northumberland steam small is slightly easier at prices ranging from 6s. to 6s. 9d. per ton, according to quality.

A joint meeting of the Durham Federation Board of Miners and Coal-owners was held yesterday in Newcastle, to consider the application from the miners for an advance of 20% in wages. After discussing the matter, it was decided to adjourn its further consideration.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Brick Kilns.—(Complete Specification). P. Crean. 16,231. October 13.
Making Fresh Water from Salt Water. F. Hocking. 16,232. October 13.
Manufacture of Sulphate of Lead. H. C. Bull. 16,233. October 13.
Filter Presses. H. H. Badams. 16,251. October 13.
Agitating and Mixing Liquids. W. S. Dimes. 16,263. October 13.
Dynamos and Electro-motors. H. Chitty. 16,264. October 13.
Concrete and Cement. F. G. Edwards. 16,284. October 13.
Compositions for Oilcloth, Varnish, etc. S. Banner. 16,321. October 14.
Multiple Evaporation. T. Slaiter. 16,326. October 14.
Smoke Consumption. H. Bowater. 16,378. October 15.
Drying Semi-liquid or Granular Substances. J. Dunn. 16,384. October 15
Preservation and Application of Chloride of Etyle. B. J. B. Mills. 16,392. October 15.
Electro-deposition of Metals. A. J. Boult. 16,399. October 15.
Manufacture of Cellulose. E. Misch. 16,408. October 15.
Mills for Crushing Ores. W. H. Coward. 16,409. October 15.
Formation of Sheet Metal Articles by Electricity.—(Complete Specification.) M. W. Dewey. 16,415. October 15.
Fire Damp Indicator. E. Gérard. 16,420. October 15.
Steam Packing. M. H. Schönstadt. 16,423. October 15.
Manufacture of Water Gases and of Illuminating Gas. T. W. Smith. 16,440. October 16.
Manufacture of Chlorate of Soda. D. Gamble. 16,460. October 16.
Vacuum Pans.—(Complete Specification.) F. H. Flottman. 16,461. October 16.
Apparatus for the Electrolytic Preparation of Metallic Sheets, Strips, or Wires. F. E. Elmore. 16,467. October 16.
Apparatus for Moistening Air. E. Edwards. 16,477. October 16.
Smoke Prevention.—(Complete Specification.) D. Bridge. 16,500. October 17.
Apparatus for Treatment of Bisulphites. J. Beveridge. 16,505. Oct. 17.
Smoke Prevention. J. T. Wood. 16,510. October 17.
Purification of Coal Gas and the Treatment of the Bye-Products. Geo. Edward Davis and Alfred Roland Davis. 16,517. October 17.
Working Metals by Electricity.—(Complete Specification.) G. D. Burton. 16,522. October 17.
Apparatus for Evaporating and Distilling Liquids. T. E. Wilson. 16,528. October 17.
Filters. F. J. Westcombe. 16,541. October 17.
Siphon Tap or Valve for Aerated Liquids. P. S. Allen. 16,542. October 17.
Decomposing Metallic Salts and Desulphurising Ores.—(Complete Specification). H. H. Lake. 16,545. October 17.
Manufacture of Paper, Paste Board, etc. B. J. Beckmann. 16,546. October 17.

Vacuum and Evaporating Pans. F. W. Scott. 16,552. October 17.
Application of Gypsum to Building Purposes.—(Complete Specification). G. F. Redfern. 16,553. October 17.
Pumps for Semi-liquid Substances. W. P. Thompson. 16,557. October 18.
Water Filters. P. Parker. 16,566. October 18.
Electric Motors.—(Complete Specification). H. Groswith. 16,570. October 18
Secondary Batteries.—(Complete Specification). C. W. Kennedy and H. Groswith. 16,571. October 18.
Soap Powders. W. Wright. 16,579. October 18.
Drying Apparatus. G. Johnston. 16,590. October 18.
Secondary Batteries. C. J. Hall. 16,603. October 18.
Feeding Apparatus for Filters. R. Morris. 16,616. October 18.
Brick Making Machinery. J. Warrington and W. B. Leachman. 16,625. October 18.
Treatment of Waste Pyrites for the Manufacture of Bricks. G. Brewer. 16,626. October 18.

New Companies.

CHADWICK AND TAYLOR, LIMITED.—This company was registered on the 22nd inst., with a capital of £240,000., in £10. shares, to take over as a going concern, the business of paper manufacturer, carried on by Mr. Thomas Chadwick, trading as Chadwick and Taylor, at the Ordsall Paper Mills, Salford, Lancashire. The subscribers are :—

	Shares.
Thomas Chadwick, Salford, paper manufacturer	1
S. Chadwick, Victoria Mills, Ancoats, Manchester, cotton spinner	1
Wm. Chadwick, Arkwright Mills, Manchester, cotton spinner	1
Miss S. Chadwick, Urmston	1
Miss J. Chadwick, Urmston	1
Miss E. Chadwick, Urmston	1
Miss R. Chadwick, Urmston	1
T. T. Chadwick, Urmston	1
James Chadwick, Salford, paper manufacturer	1

ELECTRO-CHEMICAL SYNDICATE, LIMITED.—This syndicate was registered on the 16th inst., with a capital of £5,000., in £1. shares, to acquire and work inventions, and to carry on any business, whether manufacturing or otherwise, to further the working of such inventions. The subscribers are :—

	Shares.
C. C. Marriott, 57, Lavender-sweep, S.W., clerk	1
T. Trimmel, Monument-buildings, E.C., solicitor	1
G. W. Crosby, 20 Abchurch-lane, merchant	1
C. Finney, Dashwood House, merchant	1
A. Bissland, 4, Copthall-buildings, clerk	1
J. H. Waldock, 16, Chadwick-road, Peckham, clerk	1
E. J. Wills, 46, Mortimer-street, W., reporter	1

HOWORTH'S PATENT GAS BURNER ATTACHMENT COMPANY, LIMITED.—This company was registered on the 16th inst., with a capital of £5,000., in £1. shares, to acquire and work the patent rights of Mr. W. Hy. Howorth (No. 11,826, of 1885), granted for an invention for increasing the illuminating power of gas. The subscribers are :—

	Shares.
R. S. Morrison, M.D., Cleckheaton, York	1
E. Holdsworth, Wyke, near Cleckheaton, contractor	1
L. Stead, Cleckheaton, maltster	1
A. Hall, Cleckheaton, ironmonger	1
G. Sykes, Cleckheaton, schoolmaster	1
S. H. Stocks, Cleckheaton, brewer	1
J. Frith, Cleckheaton, auctioneer	1

PETROLEUM SHIPPING COMPANY, LIMITED.—This company was registered on the 17th inst., with a capital of £100,000., in £5. shares, to acquire steam and other ships, boats, and vessels of all kinds, and any shares therein, and the shares and securities of any shipowning companies, and to undertake any liabilities and give any indemnities in respect thereof; to carry on the business of shipowners, merchants, warehousemen, wharfingers, etc., to construct roads, railways, tramways, and reservoirs, etc.; and to sink oil wells. The first subscribers are :—

	Shares.
Alfred Suart, 32, Great St. Helen's, E.C., shipbroker	1
W. C. Boniface, Claremont House, Clapton, coal merchant	1
E. A. White, 34, Jarningham-road, Hatcham	1
J. A. Salton, 32, Great St. Helen's, E.C., accountant	1
Howard Fowler, 32, Great St. Helen's, E.C., shipowner	1
H. Gibson, 4, St. Mary's-axe, E.C., solicitor	1
T. H. Fidger, Sefton-cottage, Enfield	1

PETRONITE SYNDICATE, LIMITED.—This syndicate was registered on the 16th inst., with a capital of £6,060., in £1. shares, whereof 60 are founders' shares, to acquire upon terms of an unregistered agreement of 1st inst., entered into with Wm. Sinclair, of Hull, certain letters patent for improvements in the manufacture or preparation of enamel, varnish, insulators, and coating for submarine cables. The subscribers are :—

	Shares.
F. Gordam Pape, 31, Bishop-lane, Hull	1
Wm. Gillyott, Lowgate, Hull	1
C. Muirhead, Lowgate, Hull	1
G. Bohn, Imperial-chambers, Hull	1
D. W. Sissons, 84, Beverley road, Hull	1
J. B. Willows, Landsdown House, Hull	1
T. H. Sissons, 102, Beverley-road, Hull	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

R. AND W. DAGGER, Longridge, bone, manure and provender merchants.
H. RICHARDSON AND H. FOSTER, under the style of H. Foster and Co., Backworth and Newcastle-on-Tyne, firebrick manufacturers.
R. H. WARD, W. O. WARD, AND S. WARD, under the style of Ward and Co., Exeter, manure and oilcake merchants, as far as regards R. H. Ward.
STEVENS AND CHANDLER, Hamsey, near Lewes, brick and tile makers.
A. E. WREN AND T. BROUGHALL, under the style of Wren and Co., Handsworth, brewers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

BIGNELL, JAMES WILLIAM, Sandown, mineral water manufacturer.
CRABTREE, THOMAS, AND CRABTREE (trading as S. Crabtree and Sons), late of Failsworth, Dyers.
MARSDEN, WILLIAM (late trading as W. Marsden and Co.), Blackburn paper manufacturer.
MAW, SOLOMON GERVAS, Sheffield, manufacturing chemist.

Adjudications.

BIGNELL, JAMES WILLIAM, Sandown, mineral water manufacturer.
BRAY, WILLIAM, Colton, near Leeds, gas engineer.
MARSDEN, WILLIAM (late trading as W. Marsden and Co.), Blackburn, paper manufacturer.
MAW, SOLOMON GERVAS, Sheffield, manufacturing chemist.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 18th.

Antimony Ore—			
Portugal,	9 t.		H. Emanuel
,,	15		W. Robinson & Co.
France,	44		Smith, Sundis & Co.
,,	23		Pillow, Jones & Co.
Alum—			
Holland,	73 pks.		Ohlenschlager Bros.
Ammonia—			
Belgium,	£36		Weatherley, Mead & Co.
Acetic Acid—			
Holland,	25 pks.		Phillipps & Graves
,,	76		A. & M. Zimmermann
Alkali—			
Holland,	200 c.		Taylor, Somerville & Co.
Barytes—			
Germany,	23 cks.		Pillow, Jones & Co.
Holland,	44		W. Harrison & Co.
Belgium,	21	,,	,,
Germany,	23		Constable, Henderson & Co.
,,	23		O'Hara & Hoar
,,	23		W. Harrison & Co.
Barytes—*continued.*			
Germany,	46 cks.		D. Storer & Sons, Ltd.
Boracic Acid—			
Italy,	20 pks.		W. Nicolson & Co.
Borax—			
Germany,	20 pks.		F. Stahlschmidt & Co.
Bones—			
U.S.,	13 t.		A. & W. Nesbitt
Cape,	5		J. R. Thomson & Co.
Copper Ore—			
Singapore,	5 t.		Adamson, Gilfillan & Co.
Cobalt Ore—			
Germany,	35 t.		J. Kinesberg
,,	2		J. Smither & Son
Caustic Potash—			
France,	10 pks.		Petri Bros.
Copper Sulphate—			
France,	£3,800		E. Tuteur
Cream of Tartar—			
France,	5 cks.		Ross & Deering
Spain,	3		W. C. Bacon & Co.
,,	10 C		Christopherson & Co.
France,	6 pks.		F. Richter & Co.
Italy,	5		B. & F. Wf. Co., Ltd.
,,	10		W. C. Bacon & Co.
France,	6		E. W. Carling & Co.
Cream of Tartar—*continued.*			
Italy,	10 pks.		B. & F. Wf. Co., Ltd.
,,	11		Howards & Son
Brisbane,	1		Parbury, Henty & Co.
France,	3		W. C. Bacon & Co.
Caoutchouc—			
Penang,	57 c.		T. Merry & Sons
Madagascar,	56		W. M. Smith & Sons
,,	12	,,	,,
Zanzibar,	152		L. & I. D. Jt. Co.
,,	64		Anderson, Weber & Smith
,,	40		L. & I. D. Jt. Co.
,,	27		Clarke & Smith
Madagascar,	46		Prop. Bull Wf.
Aden,	12		L. & I. D. Jt. Co., Ltd.
Singapore,	97		Adamson, Gilfillan & Co.
Zanzibar,	97		Wallace Bros.
Chemicals *(otherwise undescribed).*			
Germany,	£70		W. Burton & Son
,,	300		A. & M. Zimmermann
,,	8		G. Meyer & Co.
,,	10		Phillipps & Graves
Holland,	15	,,	,,
Chemicals—*continued.*			
Germany,	£6		T. H. Lee
,,	28		B. & N. Wvs. Co., Ld.
,,	54		T. H. Lee
Holland,	16		Barr, Moering & Co.
Germany,	500		A. & M. Zimmermann
Dyestuffs—			
Valonia			
Smyrna,	40 t.		Anning & Cobb
Saffron			
Spain,	1 pk.		B. & N. Wvs. Co., Ltd.
,,	1		Brown, Wills & Co.
Orchella			
Madeira,	30 pks.		L. & I. D. Jt. Co. Ltd.
,,	10		W. M. Smith & Son
Las Palmas,	7		Trinder, Anderson & Co.
Cochineal			
Canaries,	4 pks.		Kuhner & Henderson
,,	100		W. H. Cole & Co.
,,	12		Johnson, Rolls & Co.
,,	11		W. M. Smith & Sons
Las Palmas,	7		Trinder, Anderson & Co.
Canaries,	23		Johnson, Rolls & Co.
Annatto			
France,	5 pks.		Hurford & Middleton
Myrabolams			
E. Indies,	3,481 pks.		Beresford & Co.
,,	188		L. & I. D. Jt. Co.

Dyestuffs—*continued.*
Redwood
E. Indies, 22 t. L. & I. D. Jt. Co.
" 100 Falkenburg & Hesse
Gambier
Germany, 7 pks. Craves
Singapore, 390 R. & J. Henderson & Co.
" 729 Beresford & Co.
" 321 "
France, 204 S. Barrow & Bro.
Singapore, 108 Lewis & Reat
" 108 Horsley, Kibble, & Co.
" 510 L. & I. D. Jt. Co.
" 200 Elkan & Co.
" 367 J. H. & G. Scovell
" 247 L. & I D. Jt. Co.
Penang, 1,068 " "
Singapore, 866 " "
" 122 R. & J. Henderson
Extracts
Belgium, 100 pks. B. Kulm
Germany, 4 Craven & Co.
France, 195 L. J. Levinstein & Sons
Halifax, 120 A. J. Humphrey
France, 25 L. J. Levinstein & Sons
U. S., 40 W. A. Bowditch
Austria, 50 S. Barrow & Bro.
" 82 Humphrey & Co.
France, 20 L. J. Levinstein & Sons
Tanners' Bark
Belgium, 52 t. J. Graves
" 16 Sawer, Mead & Co.
Durban, 21 A. & W. Nesbitt
Indigo
Holland, 1 cht. A. G. Robinson & Co.
E. Indies, 7 E. Elkan & Co.
" 4 T. H. Allan & Co.
" 19 L & I. D. Jt. Co.
Germany, 6 " "
Sumac
Italy, 900 pks. J. Richter, Ltd.
" 50 J. Knill & Co.

Glucose—
U. S. 1,000 pks. 1,000 c. L. Sutro & Co.
" 350 350 Barrett, Tagant & Co.
" 500 " "
Germany, 13 125 J. Knill & Co.
" 100 100 Fellows, Morton & Co.
France, 100 100 Barrett, Tangant & Co.
U. S., 40 240 M. D. Co.
" 124 692 Union Lighterage Co., Ld.
" 30 170 L. Sutro & Co.
" 20 115 Petty, Wood & Co.
Germany, 200 200 J. F. Ohlmann
" 25 200 J. Knill & Co.
" 400 400 Baxter & Hoare
" 235 478 R. G. Hall&Co.
" 200 200 Barrett, Tagant & Co.
France, 200 200 "
" 300 300 De Paiva Norman & Co.
" 200 200 J. Barber & Co.
U. S., 40 220 Barrett & Co.

Gutta Percha—
Penang, 2 c. T. Merry & Son
Holland, 245 Robinson, Roberts & Co.
Singapore, 33 L. & I. D. Jt. Co.
" 45 Cundall & Co.
Belgium, 346 White, Child, & Boney
Singapore, 1 Kleinwort, Sons & Co.
" 1,126 Kaltenbach & Schmitz
" 810 J. H. & G. Schovell
Hong Kong, 150 L. & I. D. Jt. Co.
Singapore, 490 H. W. Jewesbury & Co.
" 264 Soundy & Son
Holland, 186 Robinson, Roberts & Co.

Glycerine—
Italy, £60 Beresford & Co.
Germany, 125 T. H. Lee
Holland, 17 Spies Bros. & Co.
Germany, 62 T. H. Lee

Isinglass—
Penang, 20 pks. L. & I. D. Jt. Co.
U. S., 3 W. M. Smith & Sons
" 17 "
Singapore, 8 L. & I. D. Jt. Co.

Manure—
St. Valery, 161 t. Lawes Manure Co.
" 260 Anglo-Continental G. Wks.
France, 130 A. Hunter & Co.
Phosphate Rock
Montreal, 152 t. Anglo-Continental G. Wks.
U. S., 2,282 Wyllie & Gordon
Sombrero Island, 650 t. Pickford & Winkfield

Nitre—
Germany, 47 cks. Craven & Co.

Naphtha—
Belgium, 7 drs. Domeier & Co.

Plumbago—
France, 10 pks. H. Heynes & Co.
Holland, 2 cks. Brown & Elmslie

Pitch—
France, 50 brls. Fellow, Morton & Co.

Paraffin Wax—
U. S., 625 brls. 171 cs. H. Hill & Sons
" 187 "
" 260 "
" 100 G. H. Frank
" 100 E. & H. Holdsworth
" 2,805 J. H. Usmar & Co.

Phosphoric Acid—
Germany, 20 pks. Phillipps & Graves

Potassium Muriate—
Germany, 152 pks. Bessler & Co.

Potassium Sulphate—
France, £75 Weatherley, Mead & Co.
Germany, 713 pks. Bessler & Co
" 303 "
France, 11 Weatherley, Mead & Co.

Potash—
Montreal, 73 c. S. Ward & Co.
Germany, 20 pks. Beresford & Co.

Pearl Ashes—
France, 100 c. F. W. Berk & Co

Stearine—
Belgium, 38 bgs. H. Hill & Sons

Saltpetre—
Germany, 47 cks. Craven & Co.
" 72 J. Hall & Son
" 62 brls. P. Hecker & Co.

Salammoniac—
Holland, £140 Barr, Moering & Co.

Sulphuric Acid—
Holland, 3 pks. Barr, Moering & Co.

Sodium Hyposulphate—
Holland, £50 Beresford & Co.
Germany, 62 "

Sugar of Lead—
Germany, 17 pks. Beresford & Co.

Tartaric Acid—
Holland, 4 pks. F.W. Heilgers & Co.

Tartar—
Italy, £780 Howards & Sons

Ultramarine—
Holland, 13 pks. Haeffner, Hilpert & Co.
Belgium, 3 W. Harrison & Co.
Holland, 10 cs. Hernu, Peron & Co
" 5 cks. Ohlenschlager Bros.

Zinc Oxide—
U. S., 100 brls. M. Ashby, Ld.

LIVERPOOL.

Week ending Oct. 21st.

Albumen—
Ghent, 10 cs. J. T. Fletcher & Co
Trieste, 10 R. Schlosser & Sons

Acetate of Lime—
Baltimore, 529 bgs.

Boracic Acid—
Leghorn, 30 cks.
" 20

Bones—
Constantinople, 156 bls.
Boston, 200 sks.

Caoutchouc—
Akassa, 2 cks 137 bgs. Royal Niger Co.
Accra, 16 pks. F. & A. Swanzy
" 10 J. H. Rayner & Co.
" 12 J. J. Fischer & Co.
" 3 E. H. Perrin & Co.
" 2 Hutton & Co.
" 2 brls. "
" 1 Davies, Robbins, & Co.
" 1 cs. 6 C. Lane & Co.
" 3 Millward, Bradbury, & Co.
" 4 Edwards Bros.
" 1
Winnebah, 2 pks. F. & A. Swanzy
" 1 C Lane & Co.
Salt Pond, 5 cs. 16 cks. Pickering & Berthoud
" 6 5 Radcliffe & Durant
" 3 A. Millerson & Co.
" 5 F. & A. Swanzy
" 1 W.B.McIver & Co.
" 1 F. Schaeffer

Caoutchouc—*continued.*
Salt Pond, 5 cs. 1 cks. W. Griffiths & Co.
" 9 3 Edwards Bros
" 1 Kinloch, Campbell, & Co.
" 9 T. E. Tomlinson & Co.
" 9 A. Miller, Bros., & Co.
C. C. Castle, 2 20 Fletcher & Fraser
" 1 W. Symington & Co.
" 2 J. Taylor
" 1 G. B. Ollivant & Co.
" 2 Ellis & Co.
" 3 J. W. Jepp & Co.
" 2 A. Myrracough
" 2 Taylor, Laughland
" 2 Ihlers & Bell
" 3 C. L. Clare & Co.
" 1 10 Mordaunt Bros.
" 2 12 W. B. McIver & Co.
" 1 7 Challenor & Co.
" 2 11 L. Hart & Co.
" 14 R. Barbour & Bros.
" 9 A. Millerson & Co.
" 2 J. Stretchburg & Son
" 4 7 Davies, Robbins, & Co.
" 13 Edwards Bros.
" 1 5 F. & A. Swanzy
" 2 C. Lane & Co.
" 2 Pitt, Bros., & Co.
" 7 H. B W. Russell
" 63 A. Miller, Bros., & Co.
" 2 4 A. Herschell
" 1 Radcliffe & Durant
" 4 27
Axim, 2 Edwards Bros.
" 1 A. Reis
" 2 6 F. & A. Swanzy
Gr. Bassam, 12 E. T. Bennett & Co.
" 4 33 W. D. Woodin
" 1 F. J. Eaton & Son
" 4 A. Millerson & Co.
" 3 Radcliffe & Durant
" 6 W. Symington & Co.
" 9 A. Reis
" 5 F. & A. Swanzy
" 2 Oppenheimer & Co.
" 9 Pickering & Berthoud
" 13 M. A. Yandle
" 5 Letchford & Co.
" 5 Universal Com. Bk.
" 2 T. E. Tomlinson & Co.
" 3 Edwards Bros.
" 1 Davies, Robbins, & Co.
" 5 Pitt, Bros , & Co.
" 5 M. Ridyard
" 2 Rider, Son, & Co.
" 1 Millward Bradbury
" 14
Sierra Leone, 8 pns. 3 brls. C Francaise
" 4 pks. Paterson, Zachonis, & Co.
" 3 brls. 1 kg. W. Waterhouse & Son

Copper Ore—
Philadelphia, 26 bdls. Melcher, Runge, Co.
Montreal, 287 bgs.
Galveston, 9,665 sks. J. Lewis & Son
Portugal, 131 t. Harrington & Co.

Carbon—
Philadelphia, 280 bgs. 25 brls. Morris, Ashley, Ltd.

Dyestuffs—
Fustic
Trieste, 187 bls. A. Cros & Co.
Extracts
Antwerp, 7 cs. 2 cks. J. T. Fletcher & Co.
Annatto
Bordeaux, 35
Sumac
Bordeaux, 25 bls.
Gambier
Akassa, 13 bgs. Royal Niger Co.
Singapore, 2,431 bls.
Valonia
Patras, 108 bgs. Georgocopulo Ponogopulo
" 90

Dyestuffs—*continued.*
Madders
Smyrna, 34 bls.
Yellow Berries
Smyrna, 29 bls.

Glycerine—
Rotterdam, 1 ck. 15 cs. 11 crbys.

Graphite—
Trieste, 20 brls. F. Parisi

Glucose—
B. Ayres, 1,5480 Williamson, Milligan, & Co.

Horn Piths
New York, 38 brls.
Hamburg, 10 cks.

Manure—
Phosphate Rock
Montreal, 150 t. A. Hunter & Co.
" 150

Manganese—
Hamburg, 2 cks.

Manganese Powder—
Hamburg, 2 cks.

Manganese Ore—
Bordeaux, 6 cks.

Ore—
New York, 161 sks.

Potash Salts—
Hamburg, 954 bgs.

Pitch—
Hamburg, 1 brl.

Phosphoric Acid—
Bremerhaven, 10 cs.

Phosphates—
Ghent, 2,547 bgs. J. T. Fletcher & Co.
Montreal, 195 t. Pickford & Winkfield

Pyrites—
Huelva, 2,051 t. Matheson & Co.
" 1,617 "
" 1,505 Tennants & Co.

Potash—
Rouen, 41 dms. 34 cks. Co-op. W. Society, Ld.

Saltpetre—
Hamburg, 46 cks.
" 46

Soap—
Bari, 160 cs.
New York, 1 Burroughs Welcombe
Boston, 4

Soapstone—
Philadelphia, 65 bgs.
" 62

Stearine—
Bordeaux, 5 cs.

Sodium Acetate—
Rouen, 18 cks. Co-op. Wholesale Society, Ld.

Tar—
Hamburg, 2 brls.

Tartaric Acid—
Bremerhaven, 4 cks.

Tartar—
Bordeaux, 5 cks.

Turpentine—
Trieste, 2 brls. Miller & Co.

Talc—
Genoa, 250 bgs. G. Hustrin
Trieste, 45 F. Parisi

Ultramarine—
Trieste, 30 cs.
Hamburg, 42

Waste Salt—
Hamburg, 280 t. 102 bgs.

Zinc Oxide—
Antwerp, 7 brls.
Terneuzen, 180 cks.
" 30 J. T. Fletcher & Co.

Zinc Ashes—
Antwerp, 16 cks. J. T. Fletcher & Co.

HULL.

Week ending Oct. 23rd.

Alumina Sulphate—
Rotterdam, 41 cks. W. & C. L. Ringrose

Albumen—
Rouen, 9 cs. Rawson & Robinson

Acetic Acid—
Rotterdam, 10 pks. Hutchinson & Son

Borax—
Hamburg, 4 brls. Wilson, Sons & Co.

Barytes—
Antwerp, 20 bgs. Bailey & Leetham

Chromoxide—
Rotterdam, 2 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 28 pks. Wilson Sons & Co.
Rotterdam, 4 cks. W. & C. L. Ringrose
Stettin, 1 cs. Wilson, Sons & Co.
Copenhagen, 800 bgs. C. M. Lofthouse
" 5 cks. Wilson, Sons & Co.
Naples, 5 "
Genoa, 10 Wilson, Sons & Co.
Marseilles, 5 "
Dunkirk, 74 pks. Wilson, Sons & Co.

Dyestuffs—
Indigo
Amsterdam, 14 chts. W. & C. L. Ringrose
Marseilles, 10 cs. Wilson, Sons & Co.
Madders
Rotterdam, 2 cks. G. Lawson & Sons
" 2 "
Amsterdam, 2 cks. W. & C. L. Ringrose
Alizarine
Rotterdam, 12 pks. W. & C. L. Ringrose
" 29 cks. Hutchinson & Son
" 13 "
" 1 cs. 27 cks. "
" 22 W. & C. L. Ringrose

Ferro Manganese—
Antwerp, 14 cks. Cammell, Woolf, & Haigh

Glycerine—
Rotterdam, 11 crbys. G. Lawson & Sons

Glucose—
Dunkirk, 40 bgs. Wilson, Sons & Co.

Napthol—
Rotterdam, 2 cs. 2 cks.

Ore—
Bordeaux, [8 cks. Rawson & Robinson

Potash—
Rotterdam, 9 cks. W. & C. L. Ringrose
" 36 G. Lawson & Sons

Plumbago—
Genoa, 80 bgs. Wilson, Sons & Co.

Phosphate—
Ghent, 100 t. Wilson, Sons & Co.
" 204 bgs. E. Kipps & Co.
Ghent, 203 t. Wilson, Sons & Co.

Salt—
Hamburg, 140 t. C. M. Lofthouse & Co.

Soap—
New York, 112 bxs. Wilson, Sons & Co.
Leghorn, 250 "

Tar—
Uleaborg, 6 brls. 24½ brls. Newton Bros.

Turpentine—
Hamburg, 1 cs. Wilson, Sons & Co.
Bordeaux, 62 cks. Rawson & Robinson

Tartar—
Bordeaux, 4 cks. Rawson & Robinson

Ultramarine—
Rotterdam, 4 pks. G. Lawson & Sons

Waste Salt—
Hamburg, 500 bgs. C. M. Lofthouse & Co.

TYNE.

Week ending October 22nd.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.

Copper Precipitate—
Huelva, 196 t. Scott Bros.

Glucose—
Hamburg, 12 cks. Tyne S. S. Co.
Rotterdam, 40 bgs. "

Pyrites—
Huelva, 1,219 t. Scott Bros.

GLASGOW.

Week ending October 23rd.

Alum—
Rotterdam, 40 cks. J. Rankine & Son

Barytes—
Rotterdam, 46 cks.
" 67

Copper Ore—
Huelva, 1,843 t. Tharsis Co. Ltd.

Dyestuffs—
Extracts
New York, 6 brls.
Madders
Rotterdam, 2 cks.
Alizarine
Rotterdam, 65 cks. 1 cs.
" 32

Glucose—
New York, 100 brls.

Potassium Prussiate—
Hamburg, 16 cks.

Phosphate—
Antwerp, 1,000 bgs.

Tartar—
Bordeaux, 1 ck.

Ultramarine—
Rotterdam, 2 cks. J. Rankine & Son

Waste Salt—
Hamburg, 130 t.

Zinc Oxide—
New York, 150 brls.
Antwerp, 50

GRIMSBY.

Week ending Oct. 18th.

Chemicals *(otherwise undescribed)*
Hamburg, 18 cs.
" 5 3 cks.
Rotterdam, 40 pks.

Zinc Ashes—
Hamburg, 10 cks.

GOOLE.

Week ending Oct. 15th.

Alum—
Rotterdam, 2 cks. 17 pks.

Antimony—
Boulogne, 1 ck. 1 cs.

Chrome Alum—
Rotterdam, 17 cks.

Dyestuffs—
Alizarine
Rotterdam, 14 cks.
Extracts
Rotterdam, 3 cks.
Rouen, 101
Madders
Rotterdam, 15 pks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 6 cs. 77 cks. 1 pcs.

Glucose—
Dunkirk, 150 bgs.

Potassium Muriate—
Rotterdam, 19 cks.

Potash—
Calais, 61 drms.
Dunkirk, 33

Saltpetre—
Rotterdam, 100 bgs.

Waste Salt—
Hamburg, 121 b.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 15th.

Ammonium Muriate—
Sydney, 3 t. 10 c. £75

Acetic Acid—
Lisbon, 24 c. £7
Barbadoes, 5 6

Ammonia—
Pt. Natal, 19 c. £20
M. Video, 1 t. 10 70

Arsenic—
San Francisco, 43 c. £36
Napier, 10 t. 13 162

Ammonium Carbonate—
B. Ayres, 1,120 lbs. £17

Alkali—
Melbourne, 12 c. £33
Lyttelton, 6 t. 1 40

Ammonium Sulphate—
Ghent, 1,018 c. £585

Bisulphide of Carbon—
Rio de Janeiro, 59 c. £64

Borax—
Keppel Bay, 10 cs. £42
Hamburg, 3 10
Melbourne, 90 c. 225
Bordeaux, 19 56
Melbourne, 4 cks. 27
Canterbury, 3 5
Melbourne, 1 t. 58
Sydney, 40 59
Natal, 2 kgs. 3

Bleaching Powder—
Rockhampton, 150 t. £1,644
Hong Kong, 5 c. 8

Benzoic Acid—
New York, 4 cs. £32

Bisulphate of Lime—
Rangoon, 2 t. £47
Palermo, 2 cks. 6

Citric Acid—
Sydney, 13 c. £98
Carthagena, 5 35
Melbourne, 20 kgs. 137
Barcelona, 2 cks. 72
Hamburg, 5 36
B. Ayres, 1,120 lbs. 68

Cobalt Oxide—
Bordeaux, 2 c. £105
Hamburg, 1 70

Copper Sulphate—
Singapore, 28 c. £30
Bourgas, 6 6
Varna, 15 15
Sydney, 60 54

Carbolic Crystals—
Cologne, 143 c. £500
New York, 155

Calcium Chloride—
Pt. Natal, 5 t. £57

Caustic Soda—
Canterbury, 5 c. £12
Sydney, 214 116
Melbourne, 4 pks. 12
Odessa, 21 230
Melbourne, 10 t. 11 148
Philadelphia, 1,050 610

Clarifiants—
Bordeaux, 20 hds. £30
Paris, 6 cks. 9
Gothenburg, 30 15

Cream of Tartar—
Sydney, 31 c. £164
" 20 98
" 40 204
Melbourne, 30 148
Canterbury, 6 31
Otago, 4 21
Durban, 1 cs. 7
Natal, 1 7

Carbolic Acid—
Melbourne, 3 c. £16
San Francisco, 5 24
Cape Town, 2 cs. 8
Lyttelton, 12 cks. 30

Coal Products—
Pitch
Calcutta, 50 brls. £23
Cette, 1,300 t. 2,903
Galatz, 15 cks. 5
Braila, 5 2
Calcutta, 51 rlts. 27
Antwerp, 143 t. 220
Galatz, 50 16
Boston, 15 40
Marseilles, 100 64
Lisbon, 100 32
Rouen, 20 92
Mauritius, 15 kgs. 6

Pitch—*continued.*
Sydney, 2 kgg. £2
Boston, 1,600 716
Cette, 1,200 t. 2,200
Antwerp, 156 240
Odessa, 300 84
Antwerp, 133 203
Genoa, 1,200 2,230
Trouville, 200 250
Rouen, 131 147
Madras, 20 7
Alizarine
Boston, 127 c. £535
Tar
Algoa Bay, 150 drms. £6
Mogador, 1 brl. 1
Galatz, 60 cks. 36
Braila, 25 14
Calcutta, 208 385 rlts. 241
Galatz, 40 23
Trinidad, 5 7
Sydney, 300 73
Galatz, 10 cks. 7
Rotterdam, 44 546
Natal, 5 rlts. 120 7
Campana, 50 71
Calcutta, 109 94
Madras, 50 24
Calais, 75 70
Rangoon, 10 12
Calcutta, 51 38
Colombo, 25 8
Benzole
Rotterdam, 54 cks. £918
" 18 pns. 318
" 32 drms. 582
Anthracene
Rotterdam, 61 cks. £418
Dusseldorf, 61 811
Rotterdam, 72 300
Cologne, 252 1,598
Naphthaline
Calais, 2 cks. £12
Melbourne, 10 drms. 6
Rotterdam, 675 bgs. 100
Treport, 30 115
New York, 94 147
Treport, 26 brls. 110

Chemicals *(otherwise undescribed)*
Malta, 16 pks. £16
Madrid, 13 40
Montreal, 20 60
" 16 70
Melbourne, 2 cks. 16
" 1 cs. 40

Chemicals *(continued).*
Cadiz, 3 cks. £13
Auckland, 9 pks. 25
Wellington, 7 14
Brussels, 4 drms. 37
Melbourne, 5 11
Sydney, 85 kgs. 482
Natal, 21 21
Jamaica, 4 5
Melbourne, 5 cs. 45
Madras, 2 12
" 11 22
Antwerp, 1 11
Hamburg, 1 18

Disinfectants—
Melbourne, 6 cks. £10
Launceston, 5 15
Otago, 33 pks. 3 cs. 43
Penang, 100 drs. 30
Madras, 120 45
Canterbury, 20 6
Natal, 21 25
Auckland, 12 15
Trinidad, 1 drm. 5
Sydney, 2 9
" 42 84
Melbourne, 7 42

Glycerine—
Marseilles, 1 cs. £8

Hypophosphite of Lime—
Rotterdam, 10 cs. £120

Iodine—
Melbourne, 1 cs. £18

Iodoform—
Melbourne, 1 cs. £43

Manure—
Barbadoes, 59 t. 6 c. £472
La Rochelle, 210 630
Jamaica, 30 172
" 10 65
Berbice, 40 410
Penang, 1,321 8
Demerara, 8 9 67
Valencia, 101 2 775
Alicante, 21 11 193
Lisbon, 19 14 101
Lyttelton, 71 8 350
Barbadoes, 18 16 169

Magnesia—
Adelaide, 7 c. £16
San Francisco, 5 15

Oxalic Acid—
Antwerp, 10 t. 3 c. £300

Potash—
Hong Kong 2 c. £6
Phosphoru -
Wellington 4 c. £32
Pearl Ash
Canterbur, 7 c. £7
Sydney, 46 38
Potash ts—
Natal, 90 cs. £670
Potassium Chlorate—
Lisbon, 2 t. 3 c. £88
New York, 100 kgs. 235
Potassium Iodide—
Melbourne, 4 cs. £127
Potassium Permanganate—
B. Ayres, 112 lbs. £3
Salicylic Acid—
Melbourne, 6 cs. £47
Salammoniac—
Hamburg, 21 c. £40
Mersina, 8 15
Varna, 10 brls. £35
Paris, 28 c. 50
Rio de Janeiro, 2 cks. 11
Saltpetre—
Algoa Bay, 9 c. £11
Natal, 5 £6
Sydney, 50 54
Sodium Bicarbonate—
Sydney, 20 c. £174
Canterbury, 15 5
Sheep Dip—
Algoa Bay, 20 c. £56
E. London, 100 cs. 290
Lyttelton, 300 800
Christchurch, 5 pks. 172
Natal, 100 280
Sodium Tartrate—
Melbourne, 14 c. £27
Sulphuric Acid—
Canterbury, 5 cs. £6
Auckland, 11 8
Sodium Sulphate—
Melbourne, 6 c. £1
Ghent, 80 t. 80
Strychnine—
Melbourne, 4 cs. 25
Tartaric Acid—
Melbourne, 20 kgs. £129
Canterbury, 4 c. 28
Otago, 2 14
Canterbury, 10 80
Melbourne, 40 260
Bourgas, 5 32
Otago, 2 13
Melbourne, 20 131
Adelaide, 1 t. 133
Sydney, 20 133
,, 10 72

LIVERPOOL.

Week ending Oct. 18th.

Alkali—
Philadelphia, 25 tcs.
Havre, 58 cks.
Ammonium Muriate—
Philadelphia, 6 t. 11 c. £163
Melbourne, 1 6 26
Antwerp, 7 9
Philadelphia, 22 16 2 q. 502
,, 5 3 125
New York, 6 10 2 160
Acetic Acid—
Santos, 13 c. 1 q. £14
Ammonium Sulphate—
Demerara, 32 t. 15 c. 3 q. £395
Bordeaux, 10 2 1 112
Valencia, 50 19 1 586
Demerara, 86 12 3 1,049
New York, 105 13 1,254
Rouen, 10 110
Barcelona, 10 5 1 115
Ammonium Carbonate—
Genoa, 1 t. 17 c. 1 q. £60
Havre, 2 5 3 66
Venice, 1 11 1 51
Rotterdam, 6 6
Genoa, 10 16
Hamburg, 5 9
Nantes, 3 100
Alum—
Gijon, 1 t. 1 c. £5
Bari, 1 1 2 q. 5
Patras, 2 2 11
Quebec, 8 15 45
Rio de Janeiro, 1 3 7
Calcutta, 29 5 146
Melbourne, 1 7 7
Montreal, 35 17 179

Alum—*continued.*
Constantinople, 1 t. 13 c. 1 q. £8
Alexandretta, 1 11 7
London, Ont., 1 7 6
Seville, 1 2 6
Beyrout, 2 12 2 13
Ibrail, 1 9 7
Madras, 9 17 1 49
Callao, 2 18 15
Smyrna, 7 10 2 37
Magog, 1 12 1 25
Antimony Regulus—
Amsterdam, 10 t. 1 c. £714
Bleaching Powder—
Boston, 321 cks.
Calcutta, 71 cs.
Chicago, 80 pks.
Genoa, 28
Ghent, 16
Halifax, 6
Hamburg, 120
Hong Kong, 35
Montreal, 23
New York, 306
San Sebastian, 17
Boston, 530 174 tcs.
Buenos Ayres, 34 brls.
Hong Kong, 35
Melbourne, 30
Montreal, 69 22 tcs.
Nantes, 22 brls. 50
Naples, 54 20
New York, 176 87
Rouen, 111
San Francisco, 34 brls.
Borate of Lime—
Hamburg, 1,087 bgs. £650
Brimstone—
Calcutta, 9 t. 18 c. 2 q. £49
Carbarien, 1 6 2 9
Boracic Acid—
Hamburg, 2 t. 2 c. 2 q. £64
Borax—
Rosario, 2 t. £55
Rotterdam, 20 cks. 158
Amsterdam, 6 10 c. 192
Copperas—
Constantinople, 16 t. 10 c. £32
Beyrout, 6 t. 6 13
Calcutta, 14 1 1 q. 31
Syra, 7 17
Montreal, 9 14 19
Caustic Soda—
Algiers, 30 dms.
Algoa Bay, 5 cs.
Amsterdam, 85 bxs.
Bahia, 25
Barcelona, 30
Beyrout, 30
Bilbao, 7
Bombay, 23
Boston, 315 10 brls.
Carthagena, 20
Chicago, 65 pks.
Copenhagen, 15
E. London, 2
Genoa, 270
Gijon, 8
Havana, 50
Hong Kong, 12
Iquique, 10
Lisbon, 18
Malaga, 36
Malta, 10
Maranham, 10
Mazatlan, 220
Melbourne, 36
Mexico City, 30
Montreal, 282
New York, 1,195
Norrkoping, 2
Odessa, 150
Paraiba, 5
Pernambuco, 60
Philadelphia, 135
Portland, 60
Rotterdam, 4 cks. 107
San Francisco, 150
Santander, 24
Santos, 2
Seville, 318
Stettin, 30 190
Stockholm, 15
Tunis, 15
Vera Cruz, 25
Yokohama, 323
Amsterdam, 10
Ancona, 20
Antwerp, 2
Barcelona, 112
B. Ayres, 66
Ceara, 70
Charlotte Town, 35
Corfu, 35
Gefle, 8
Genoa, 94

Caustic Soda—*continued.*
Hamburg, 6
Hong Kong, 12
Lisbon, 10
Messina, 40
Nantes, 256
Naples, 30
New York, 150
Rio de Janeiro, 30
Rouen, 57
St. Johns, 25
St. Petersburg, 250
San Francisco, 70
Citric Acid—
Gijon, 2 c. £14
Lisbon, 5 40
Montreal, 2 15
Cobalt Oxide—
Lisbon, 1 c. £54
Copper Sulphate—
Hamburg, 9 c. £8
,, 5 t. 9 95
Montreal, 7 7 136
Ancona, 15 1 q. 13
Rouen, 84 1,615
Barcelona, 15 6 275
Melbourne, 17 4 277
Genoa, 5 1 98
Stettin, 2 10 3 54
Ancona, 2 2 2 38
Bari, 9 19 1 203
Genoa, 25 2 3 44¹
Venice, 19 12 365
Alexandria, 7 2 7
Rouen, 11 9 208
Lisbon, 6 2 120
Gothenburg, 6 2 3 105
Melbourne, 10 177
Adelaide, 10 183
Port Dundas, 1 25
Melbourne, 10 193
Batoum, 1 15 130
Genoa, 4 2 74
Ghent, 12 3 11
Konigsberg, 1 6 2 24
Leghorn, 15 18
Bordeaux, 50 1 2 900
,, 11 8 177
Montreal, 25 2 450
Naples, 2 10 1 45
Nantes, 153 15 2,810
Tarragona, 12 13 217
Singapore, 5 120
Syra, 16 2 14
Venice, 20 2 380
Carbolic Acid—
Santander, 2 c. £8
Calcutta, 2 t. 7 12
Hamburg, 2 2 2 q. 64
,, 4 19 1 82
Cadiz, 7 16
Caustic Potash—
Antwerp, 2 t. 1 c. £41
Chemicals (*otherwise undescribed*)
Bombay, 1 t. 9 c. 2 q. 19
B. Ayres, 10 8
Rouen, 150 750
Epsom Salts—
Havana, 10 brls.
Rio de Janeiro, 50 kgs.
Santos, 20
Gypsum—
New York, 20 t. 3 c. 3 q. £60
Glycerine—
Hamburg, 1 t. £205
,, 8 11 c. 206
Iron Oxide—
New York, 4 t. 15 c. £55
Valparaiso, 10 12 35
Lead Nitrate—
Lisbon, 8 c. 3 q. £9
Magnesia—
Bahia, 10 cs. £29
Manure—
Havre, 101 t. 1 c. 3q. £353
St. Nazaire, 101 11 5,260
New York, 9 42
Valencia, 80 13 2 264
Oxalic Acid—
Havre, 15 t. 4 c. 2 q. £490
Barcelona, 5 11 1 164
Potassium Bichromate—
Odessa, 3 t. £105
Galveston, 4 c. 1 q. 8
Phosphorus—
Vera Cruz, 3 c. 2 q. £24
,, 7 3 41
Potassium Chlorate
New York, 4 t. 3 c. £234
Boston, 15 45
Gothenburg, 10 466
B. Ayres, 2 93
Havana, 2 2 105

Potassium Chlorate—*continued*
Hiogo, 10 t. £50
Hong Kong, 2 5 10
Malta, 12
Naples, 10
San Sebastian, 10
New York, 5 23
Santos, 2 9
Yokohama, 10 45
Bari, 1 4
Philadelphia, 5 2
Rotterdam, 3 1
Stockholm, 2
Gothenburg, 11 5
Hamburg, 10
Montreal, 10
Ancona, 1 10
Potash—
Montreal, 6 c. £9
Ceara, 3 9
Pitch—
Valparaiso, 100 brls.
Potassium—
Calcutta, 5 lbs. £14
Sheep Dip—
B. Ayres, 5 t. 10 c. £139
Algoa Bay 425 drs. 120
B. Ayres, 4 t. 17 c. 2 q. 140
Sodium Arsenate—
New York, 2 t. 2 c. £59
Sulphur—
New York, 50 t. 2 c. £313
Boston, 25 1 105
Demerara, 8 1 3 q. 46
Toronto, 7 8 2 54
Boston, 145 7 621
New York, 50 2 225
,, 50 2 225
Boston, 50 217
Ceara, 9 5
Sodium Chlorate—
Genoa, 6 c. £18
Salt—
Amsterdam, 101 t.
Antwerp, 100
Benty, 95
Boston, 60
B. Ayres, 28
Cameroons, 25
Kingston, 8
Lagos, 170
Montreal, 670
New York, 120
Opobo, 146 17 c.
Para, 480 6
Pensacola, 500
Rio de Janeiro, 1¾
St. Johns, 5
Savannah, 966
Trinidad, 30
Wellington, 394
Baltimore, 350
Banana, 298½
Barbadoes, 16½
B. Ayres, 35
Cameroons, 20
Copenhagen, 197
Ghent, 147
Halifax, 8
Kansas City, 200
Lagos, 20
Savannah, 25
Manoh, 25
Manaos, 65
Montreal, 158
Old Calabar, 180
Opobo, 150
Rangoon, 80
Rio de Janeiro, 2 4
,, 42
San Francisco, 50
Savannah, 771
Sherbro, 100
Tuan, 2,791
Soda Ash—
Baltimore, 131 tcs.
Barcelona, 2 cks. 70 brls.
Boston, 216 500 bgs.
Brisbane, 165
Buffalo, 60 brls.
Calcutta, 4
Canea, 50
Genoa, 35
Leghorn, 42
Maranham, 25
Montreal, 194 50
New York, 35
,, 949 134 260
Odessa,
Philadelphia, 706
Portland, 10
Rettimo, 53
Rio de Janeiro, 195
Salonica, 200

Soda Ash—*Continued.*
Santos, 10 cks.
Sherbrooke, 13
Smyrna, 280
Syra, 15
Toronto, 3
Valleyfield, 29
Baltimore, 251
,, 78
Beyrout, 50
Boston, 235 100
Constantinople, 25
Lisbon, 10
Melbourne, 74
Montreal, 17
New York, 330 15
Oporto, 16
Rosario, 100
Smyrna, 150

Soap—
Belize, 675 bxs.
Bombay, 41 cs.
B. Ayres, 1
Constantinople, 1
Curacao, 60
Genoa, 50
Loanda, 1,120
Malta, 30
Naples, 1
Rosario, 1
St. Thomas, 400
Teneriffe, 500
Alexandria, 30
Algoa Bay, 52
Amsterdam, 150
Antwerp, 585
Baltimore, 19
Belize, 890
Bombay, 7
Calcutta, 10
Callao, 20 2
Cameroons, 50
Cape Coast, 100
CapeMount, 24
Cape Town, 500
Christiania, 131 13 pks.
Durban, 75
E. London, 18
Genoa, 1
Gibraltar, 114
G. Canary, 600
Hamburg, 1 ck.
Kingston, 1,960
Lagos, 54
Livingstone, 142
Loanda, 1,180
Madras, 12
Montreal, 4
Mozambique, 20
New York, 30 40 pks.
N. Kombi, 2 dms.
O. Calabar, 100
Opobo, 1,500
Orotava, 168
Pimental, 1
Pt. Natal, 424
Rotterdam, 5,000 210
St. John's, 130
St. Lucia, 100
Shanghai, 1,066
Sierra Leone, 100
Teneriffe, 370
Toronto, 200

Sodium Silicate—
Carthagena, 17 brls.
Alicante, 10
Bahia, 12
Carthagena, 17

Sodium Bicarbonate—
Adelaide, 107 kgs.
Bombay, 40
Brisbane, 59
Catania, 2 cks.
Christiania, 100
Constantinople, 1
Hamilton, 325 15
London, Ont., 100
Melbourne, 300
Montreal, 500
Odessa, 110
Portland, Or., 100
Toronto, 150 20
Sydney, 40
Stettin, 79
Summerside, 20

Soda Crystals—
Montreal, 200 brls.
Alexandria, 30
Gibraltar, 10
Hamilton, 275 kgs.
Naples, 11 cks.
New Orleans, 167
New York, 125
Philadelphia, 280 167
St. Johns, Nfld., 10 20
Smyrna, 190
Toronto, 450

Sodium Carbonate—
Boston, 112 brls.

Salammoniac—
B. Ayres, 1 t. 9 c. 3 q. £57
Galatz, 17 2 29
Bombay, 4 8 120
Gijon, 2 3 5
Genoa, 9 16
Havana, 4 1 7
Malta, 11 19
Smyrna, 1 35
Syra, 5 1 10
Toronto, 15 2 27
Alexandria, 18 32
Larnaca, 2 3 5
Naples, 11 18
Philadelphia, 2 11 88

Salt Cake—
Phiadelphia, 23 t. 10 c. £37
Baltimore, 296 19 695

Saltpetre—
Rosario, 3 t. £67
Montreal, 17 c. 1 q. 21
Bahia, 2 17 64
Halifax, 10 11
Larnaca, 2 17 2 61
Manaos, 10 3 13
Para, 10 11
Ceara, 10 12

Sodium Biborate—
Antwerp, 8 t. 15 c. 2 q. £268
Rotterdam, 16 1 25
Guantanano, 4 3 8
Hamburg, 10 2 2 604

Sodium Nitrate—
Valencia, 2 t. 10 c. 2 q. £22
Hiogo, 121 13 2 1,025

Sugar of Lead—
Calcutta, 3 t. 4 c. £87

Superphosphate—
G. Canary, 13 2 c. £28

Soda Salts—
New, 2 t. 12 c. £30

Tartaric Acid—
Gijon, 2 c. £14
Montreal, 1 t. 4 166
,, 7 52

Tar—
Oporto, 50 brls.
Sierra Leone, 30

GLASGOW.

Week ending October 23rd.

Ammonia—
Demerara, 22 t. 12 c. £259
B. Ayres, 20 49

Ammonium Sulphate—
Demerara, 65½ t. £737
Nantes, 35 10 c. 425

Bleaching Powder—
Calcutta, 244½ c. £85
San Francisco, 303¼ 106

Chemicals (*otherwise undescribed*)
Demerara, £454

Dyestuffs—
Extracts
Montreal, £116
Quebec, £129
Logwood
Montreal, 24 t. 14½ c. £206
Quebec, 296 £118. 17s.

Manganese Oxide—
New York, 405¾ c. £189

Naphtha—
Rouen, 8 t. 12½ c. £125

Potassium Bichromate—
Nantes, 5 t. ¾ c. £120
Rouen, 49 3½ 1,582
Gothenburg, 102¼ 140
Japan, 5 8½ 177
Rotterdam, 6 cks. 90
Quebec, 82 c. 144

Prussiate—
New York, 10 t. £840

Potassium Prussiate—
Amsterdam, 3 cks. £80

Paraffin Wax—
Nantes, 5 t. 5 c. £137
Rouen, 11 18 375
Japan, 32 12½ 800

Pitch—
Oporto, 40 t. £42
Quebec, 57 10¾ c. 120
Amsterdam, 111 t. 110

Phosphate—
Demerara, 57 t. £190
Nantes, 19 14½ c. 40

Sodium Bichromate—
Rouen, 17 t. 7½ c. £460
Montreal, 1 13½ 39
Quebec, 61 79

Sulphuric Acid—
Madras, 15 t. 8½ c. 82

Soap—
Demerara, 150 c. 75
Calcutta, 1 t. 19¾ 27

Salt—
Demerara, 17 t. 17 c. £32. 10s.

Sulphur—
Demerara, 22 t. 10½ c. £118

Soda Ash—
Brisbane, 80¾ c. £22
New York, 208¾ 58

Tar—
Madras, 83 t. 3 c. £190
Brisbane, 125 glns. £11. 15s.

Tartaric Acid—
B. Ayres, 12 c. £86

HULL.

Week ending October 21st.

Alkali—
Libau, 15 kgs.
New York, 170 cks.

Bone Size—
Harlingen, 22 cks.

Bleaching Powder—
Drontheim, 32 cks.

Copper Sulphate—
Christiania, 8 cks.

Caustic Soda—
Antwerp, 18 drms.
Amsterdam, 36
Christiansand, 5
Dunkirk, 9
St. Petersburg, 50

Chemicals (*otherwise undescribed*)
Antwerp, 31 cs. 2 cks.
Christiania, 2 8 10 pks.
Christiansand, 15
Copenhagen, 1 13
Dunkirk, 36
Genoa, 45
Gothenburg, 16 40 5
Hamburg, 55 10 7
Helsingfors, 2
Konigsburg, 20
Libau, 24
Leghorn, 6
Libau, 55 20
Marseilles, 56 20
Naples, 20
St. Petersburg, 113 20
Rotterdam, 20
Stettin, 1 40 62

Dyestuffs (*otherwise undescribed*)
Antwerp, 1 ck.
Christiania, 100 bgs.
St. Petersburg, 8 cs.
Rotterdam, 3 drms. 2 1
Reval, 51

Manure—
Dunkirk, 191 t.
Rotterdam, 200 bgs.

Pitch—
Antwerp, 90 t.
Leghorn, 193
New York, 16

Soap—
Christiansand, 40 cs.

Tar—
Antwerp, 1 ck.
Christiania, 5

TYNE.

Week ending October 22nd.

Alkali—
Amsterdam, 5 t. 17 c.
Gothenburg, 3 17

Ammonium Carbonate—
Copenhagen, 5 c.

Bleaching Powder—
Genoa, 10 t. 5 c.
Christiania, 20
Hamburg, 56 10
,, 19 6
Amsterdam, 29 19
Gothenburg, 4 2
Antwerp, 75 15
Amsterdam, 19 18
Lisbon, 10

Bleaching Powder—*continued.*
Rotterdam, 7 12
,, 12 19
,, 4 10
Libau, 36 2
Drontheim, 6

Caustic Soda—
Antwerp, 15 t. 12 c.
Copenhagen, 5

Calcined Magnesia—
Genoa, 19 c.
Antwerp, 1

Litharge—
Hamburg, 11 c.

Magnesia—
Genoa, 100 t.
Hamburg, 10 c.
Antwerp, 1

Potassium Chlorate—
Hamburg, 11 c.
,, 10

Potassium Bichromate—
Hamburg, 7 c.

Potassium Chloride—
Malmo, 1 t. 13 c.

Pitch—
Havre, 340 t.

Soda—
Genoa, 10 t. 2 c.
Randers, 45 6
Aarhuus, 20 18
Landskrona, 10 15
Antwerp, 3
Mykjobing, 5 8
Rotterdam, 26 2
,, 19 3
Copenhagen, 25 1

Soda Ash—
Christiania, 9 t. 19 c.
Aarhuus, 2 7
Gothenburg, 127 6
Antwerp, 5 3
Odense, 3 6
Copenhagen, 19 18

Sodium Chlorate—
Hamburg, 2 t. 10 c.
,, 1 13
Rotterdam, 11

Soap—
Antwerp, 3 q.

Sodium Suphate—
Copenhagen, 5 t. 11 c.

Tar—
Hamburg, 18 c.

GRIMSBY.

Week ending October 18th.

Coal Products—
Dieppe, 140 cks.

Chemicals (*otherwise undescribed*)
Antwerp, 4 pks.
Dieppe, 34 cks.

GOOLE.

Week ending Oct. 15th.

Bleaching Preparations—
Antwerp, 15 cks.
Dunkirk, 30

Benzole—
Hamburg, 15 drms.
Rotterdam, 18

Coal Products—
Antwerp, 50 cks.
Calais, 13
Rotterdam, 131

Chemicals (*otherwise undescribed*)
Hamburg, 131 cks.
Rotterdam, 20

Dyestuffs (*otherwise undescribed*)
Boulogne, 2 cs. 11 cks. 5 drms.

Manure—
Boulogne, 63 bgs.

Pitch—
Antwerp, 241 t.

PRICES CURRENT.

WEDNESDAY, OCTOBER 29, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. ,,	1	12	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880 = 28° .. .. per lb.	0	0	3
,, = 24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	11	3
,, ,, (grey), Hull .. .. ,,	11	8	9
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	15	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	7½
,, 50/90 ,, ... ,,	0	3	7
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¼
,, (crude 60°) .. .. per gallon	0	1	7
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	7
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	15	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	10
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	58	10	0
,, Sulphate .. .. ,,	18	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	10	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	10	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	10	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	7½
Oils:—			
Cotton-seed .. .. per ton	21	0	0
Linseed .. .. ,,	25	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅜
,, American .. .. ,,	0	0	5⅜
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	3	5	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	0⅛
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	0	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	7	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¼
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	12	6
,, ,, (70 % Caustic Soda) ,, .. ,,	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	6	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	31	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	1	17	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,	0	0	5¾
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone : Best Quality .. .. ,,	4	5	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	100	0	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	25	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

THE

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In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers.

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

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THE MANCHESTER TECHNICAL LABORATORY.

LECTURES ON SCIENTIFIC SUBJECTS OF POPULAR INTEREST.

ON Tuesday evening last, the second lecture of the series was given by Mr. George E. Davis; the subject being "Domestic Smoke."

The chair was taken by Dr. A. Ransome, chairman of the Manchester and Salford Sanitary Association, and lecturer on Hygiene at the Owens College, Manchester. There was a good attendance of gentlemen interested in the subject of "Domestic Smoke," including several representatives of the city corporations.

Doctor Ransome said that a sooty atmosphere had an indirect influence on the health of towns by causing housewives to shut their bed-room and other windows against its contaminating effects. Improper ventilation, he believed, produced an excessive amount of consumption. There were abundant proofs that confined air, produced by want of proper ventilation, was one of the chief causes of consumption, and that neglected ventilation was often attributable in large towns to the smoke which pervaded the atmosphere. The Chairman then called upon Mr. Davis to deliver his lecture.

DOMESTIC SMOKE.

Mr. Davis said:—

> "The advanced guard of King Fog occupied our capital yesterday, and travelling at night was accompanied by all the familiar miseries of his reign—a stifling irritating atmosphere, trains all at sixes and sevens, fires along the line, and a cannonade of signals under one's carriage. It seems earlier than usual for this sort of thing, and I heard say it is due to the 'anti-cyclone.' It is a pity the 'anti-cyclone' cannot be induced to move on."

This is how the coal-burning season has been heralded in by the London correspondent of one of our evening papers. Two days later we read:

> "The dense fog which hung over London during the last two days has happily disappeared and been succeeded by a mild west wind, bringing rain. Yesterday evening the fog was very bad, and over a large part of the metropolis omnibus and tramcar traffic was entirely suspended, while the drivers of hansoms and other vehicles were in many cases obliged to dismount and lead their horses."

A pretty spectacle indeed of the scientific attainments and boasted civilization of the 19th century. But let us read further, for even if our municipal authorities, together with ourselves as individuals, have so far forgotten our duty to each other, the smoke question has, for many years, never been neglected by the public press.

The rather dense fog which prevailed in London during the first two days of the past week worked an enormous amount of mischief, for the death-rate, which was 17·4 for the week previous, rose to 20·5 for last week, the average of the immediately preceding five weeks being 16·8. In plain figures, the number of deaths last week showed an increase of 269 on the week before, and of 339 on the average of five weeks. A single day's fog, therefore, may mean the loss of 170 lives. "More than a battle counts its slain." Against such a deadly enemy, carrying out its fatal mission so silently

and surely, it becomes as imperative a duty on health authorities to combat as it is to attend to drainage and other sanitary arrangements.

A correspondent of the *Manchester Examiner and Times*, in July last, wrote:—

> "When wood gave place to coal as fuel the element smoke was introduced at the same time, and the production of coal, consumed in this country alone, gradually increasing from comparatively a few tons in the year now amounts to upwards of 150 millions of tons annually, and has now brought us face to face with an evil which the Duke of Albany decribed as one 'too grievous to be borne, and for which a remedy must be found.' In London alone, every morning, some four millions of chimneys commence to pour out smoke, which, passing upwards, forms the smoke cloud hanging over the metropolis. Town-smoke includes all that combination of gas and fume which contaminates the air of towns—that which makes the difference between town air and country air. A country visitor to a large town cannot fail to be struck with the contrast thus presented to him; instead of the clear, bracing air which he breathed in the country, he now breathes in a dense atmosphere, oppressive in its action and uncleanly in its effect. The results are everywhere manifest, on the buildings and the people.
>
> "During the fogs of the winter of 1880, the mortality in London rose to 40 per cent. higher than any rate since the last cholera epidemic. This mortality did not extend to the provinces, and the excess was almost wholly due to diseases of the respiratory organs. In the effect of smoke on the Houses of Parliament, we have the direct testimony of Mr. Shaw-Lefevre, M.P., who tells us that the cost of preparing the exterior of the building, owing to the destruction of the beautiful carved work, amounts to £2,500. annually.
>
> "Air polluted with smoke is the cause of many evils. It injuriously affects the health and comfort of the community, destroys public buildings, deteriorates perishable fabrics, injures horticulture and vegetation generally, and entails in various ways unnecessary expenditure, whilst smoke, in combination with fog, diminishes vitality, and there is ample testimony to the fatal influence of smoke-laden fogs. Carbon in a fine state of division enters the tissues, and has the effect of blocking up the pores, producing a coat of carbon overlaying the tissues. 'It is found in the post-mortem rooms in metropolitan hospitals,' says Mr. Romanes, 'that the lungs of patients are overspread with a black layer of carbon, and we are not able to sponge the lungs of people during life, as we can sponge the leaves of plants.'"

I do not believe that the knowledge of the evils attributable to coal smoke is as widely disseminated as it should be. Directly that the winter fogs make their appearance, the public is up in arms, protesting against the emanations, imaginary and real, from the chimneys of neighbouring manufactories, but I think I am correct in saying that not one householder in ten thousand thinks for a moment that he is a contributor to the smoke and fog-producing process. The sooner that the householder understands the real bearings of this question, the nearer we shall be to the time when so-called "fogs" will be numbered amongst the things of the past.

Householders have to thank themselves, and themselves entirely, for the fogs under which we are continually suffering. In a paper read in this city over eight years ago, I stated my belief that if we were to banish all the factories for ten miles round, we should have the so-called fogs quite as intense as ever. I further stated that "if we wish to clear the atmosphere our first difficulty is with domestic chimneys."

The views then expressed may be repeated, with emphasis, to-night. I do not however believe that the average householder imagines for a moment that he does any harm by sending the products of the combustion of coal into the open air. If he has a thought upon the subject, he probably consoles himself with the idea that the amount of his contribution is so small as to be inappreciable. Let him not lay such a flattering unction to his soul; multiply the individual contribution by four millions, and you get a London "fog," and by three-quarters of a million, and you produce a Manchester "fog."

The question of smoke-burning is not so easy as it appears at first sight. During the past twenty years I have visited most, if not all, the public exhibitions of appliances having this object in view, and when I held the position of Government Inspector of Chemical Works I was invited to many private trials of stoves and other apparatus for the prevention of smoke. As the outcome of my experience I may say that I have not yet seen one single appliance which will yield a smokeless chimney with a house fire under all conditions, and more often than not I have seen a so-called smokeless grate sending off more smoke than an ordinary one.

In order to successfully combat the evils of smoke, we must deal with the subject systematically. I must show you how smoke is produced, of what its component parts consist, and thirdly, how it may be avoided.

* * * * * * *

Let us cast our imaginations back to the days, when Æschylus in one of the most severely chaste of human compositions, immortalized the Greek conception of the origin of fire, a symbol of the fate of those who were destined to become the greatest benefactors of humanity.

Wood was burned in a large bowl supported on a tripod, and the smoke was allowed to escape from the apartment as best it might. Of course various expedients were adopted to minimise the evils of smoke in the various apartments, the poor had to suffer the grossest inconveniences (for there were no chimneys in those days), while the rich burned hard and fragrant woods, and even spices, doing as we are apt to do now-a-days in sanitary matters, hiding one odour by another more pungent, instead of endeavouring to remove the cause of it altogether.

Gradually wood gave way to charcoal, which was burned in an open brazier, and here it may be mentioned that at as late a period as the end of the last century our English House of Commons was heated by charcoal, burned in an open brazier.

We have not, however, to deal to-night with any but the popular fuel, COAL, but I have introduced the subject of wood and charcoal to help us later on and to serve as an apology for the introduction of chimneys. The organisation that was proof against wood-smoke quailed before the volatile spirit of its black brother.

The introduction of stone-coal in the place of charcoal and wood met with much opposition, and on reference to Parliamentary annals we find that a proclamation was issued in the reign of Edward I., and another in the time of Elizabeth, prohibiting the use of stone-coal in London during the sitting of Parliament, lest the health of the knights of the shire should suffer during their sojourn in the metropolis.

Thus early were the evils of coal smoke recognised, and we have gone on submitting to the almost intolerable nuisance for nearly two hundred and forty years. About the year 1648 the citizens of London, aware of the damage that coal smoke was doing them, petitioned Parliament against the use of stone-coal from Newcastle, the use of which in those days could not have occasioned one ten-thousandth part of the evil existing amongst us to-day.

Evelyn, the author of "Sylvia," in 1661, in a work addressed to King Charles II., describes coal smoke in the following words:

> "This is that pernicious smoke which sullies all her glory, super-inducing a sooty crust or fur upon all that it lights, spoiling the movables, tarnishing the plate gildings and furniture, and corroding the very iron bars and hardest stones with those piercing and acrimonious spirits which accompany its sulphur, and executing more in one year than to the pure air of the country it could effect in some hundreds. It kills our bees and flowers abroad, suffering nothing in our gardens to bud, display themselves, or ripen, and it was by many observed that in the year when Newcastle was besieged and blocked-up in our late wars so as through the great dearth and scarcity of coals these fumous works, many of them were either left off, or spent but few coals in comparison to what they now use; gardens and orchards planted even in the heart of London were observed to bear such infinite qualities of fruit as they never produced the like either before or since, to their great astonishment; but it was by the owners rightly imputed to the penury of coals and the little smoke which they took notice to infect them in that year."

Gentlemen, I ask you to weigh well the words of Evelyn just read to you, and to put the question to yourselves, whether we are any better off, so far as the smoke nuisance is concerned, than they were in those days; whether we have each, individually, done all we can to mitigate the nuisance.

Let us now see how smoke is produced. When coal is used as fuel for ordinary house fires, only a portion of it will undergo complete combustion. If the coal was pure carbon, the burning of it if thoroughly accomplished, would result in the formation of carbonic acid a colourless gas, which, in proper quantity in the atmosphere, is not injurious.

Nature has provided us with a remedy against the over-production of carbonic acid. The flowering plants, the trees and shrubs all require carbonic acid for their existence, and provided they could obtain such food, free from admixture with acid vapours, they would thrive upon it and not die until their life-cycle was completed. But coal is not pure carbon. It usually contains:—

Carbon	82·0.
Hydrogen	5·5
Nitrogen	1·6
Sulphur	1·6
Oxygen	5·0
Ashes	4·3
	100·0

When such coal is used for fuel, a large quantity of smoke is emitted when the fire is first lighted, and also, when every subsequent charge of raw coal is placed upon the fire, smoke of more or less intensity is produced. It is the combination of these two smokes that produces our so-called fogs, the manufacturers' smoke has but little to do with them.

This smoke consists of particles of carbon vapours of hydrocarbons, similar in kind to paraffin oils, sulphuretted hydrogen, sulphurous acid and other not very savoury bodies. This mixture all escapes into the chimney, and is usually defined "smoke," which finding its way into a damp, still atmosphere, produces what we have been pleased to call "fog." If anyone wishes to see which class of chimneys really causes the nuisance, let him perambulate the lower parts of Manchester and Salford, or in fact any large town, between the hours of five and seven on any cold winter morning. At this time householders are lighting their fires and everything is cold—grate, chimney, air, all are cold and in splendid order for the production of the Maximum of smoke.

An American expert writes of the London atmosphere as follows:—

> "The vast amount of coal consumed for domestic purposes accounts for the only difficulty they have in clearing the atmosphere, for in London, smoke from factory chimneys is practically prevented, while from those in Paris volumes of smoke, rivalling Cincinnatti, are constantly emitted, yet the London atmosphere is smoky while that of Paris is clear. In London vast quantities of bituminous coal are consumed for domestic purposes, in Paris, none. We must therefore conclude that the difference in the atmosphere of the two capitals is due to a difference in domestic conditions."

The first problem to solve by those who essay to produce a smokeless grate, is that of showing us how to light a fire without producing smoke. Let us now see the effect of placing raw coal on to a moderately hot fire.

You will now see the difficulties we have to contend with; once get the householder to recognise the fact that most morning fogs are caused by the smoke of first-lighted fires, which the damp still air will not carry away, and we may hope to see the last of them; but even then the immense damage to vegetation in and around our towns, caused by the sulphurous acid from coal-smoke will not be reduced one jot.

We have not to go far to observe the effect of acid gases on vegetation. We need not go to Widnes or St. Helens for specimens of trees or shrubs killed by smoke and its accompanying gases. A walk up the Bury New Road shows us the exact spot where grass ceases to grow, and the few specimens of trees in the gardens testify to the deadly atmosphere in which the inhabitants are bound to live. An old inhabitant of Manchester has informed me that he used to walk on the river bank from Ancoats to Chorlton-on-Medlock and gather primroses, and remembers the time when a luxuriant row of trees fronted the roadway at All Saints'. Is there no chance of our ever seeing trees growing again in our public squares?

Tree planting has been of late years much indulged in, in and around Manchester, but the vile atmosphere will not allow them to live, let alone to flourish. The only way to get trees to grow is to purify the atmosphere, and then perhaps, when trees will grow, life generally will be more enjoyable.

As I have tried to point out to you the sulphurous acid of coal-smoke falls to the ground in the fogs and rain, and renders the ground so acid that nothing will grow, a zone appearing where ever the grass is destroyed.

The sulphur of the coal burns as I have already stated to sulphurous acid, and produces the same chemical compound, as by burning sulphur in oxygen. In order to impress upon you the destructive nature of the substance, I have arranged a few experiments.

The gas in the flask is sulphurous acid, and is one of the component parts of smoke as I have already explained. Coal usually contains about 8 pounds of sulphur in every thousand, which on combustion escapes as sulphurous acid, so that the 130 millions of tons consumed annually in Great Britain produce about three millions of tons of oil of vitriol, which is showered down over the surface of this little island every year, killing flowers, grass, and trees in our towns and suburbs, and destroying human life in proportion "More than a battle counts its slain."

The evil lies with this invisible sulphurous acid. I will show you its action on certain colours.

In order to show you that this acid is the same as that produced from the combustion of coal, coke, or even gas, I have arranged the next experiment. In my last lecture on manufacturing smoke I showed the action of sulphurous acid on a variety of organic colours, I am now going to burn a piece of very sulphurous coal, and show you the effect of a solution of the gas upon similar colours, in order to show you the damage likely to ensue from the sulphurous acid of coal-smoke.

Not only does the sulphurous acid affect colours, but by the absorption of atmospheric oxygen it becomes converted into sulphuric acid or oil of vitriol which permeates everywhere and does an immense amount of damage. Textile goods are tendered, made rotten and destroyed by continued exposure in shop windows where gas is burning. People say "the gas has made them rotten," whereas it would be more correct to say—"the sulphurous acid has made them rotten."

I have here two pieces of cotton, which I will strain by means of equal weight: one of them has been treated with the products of combustion of the Salford gas and dried, while the other remains untreated. You see that the treated piece has given way; it was, in fact, rotten.

I can give you another very good illustration of the action of the sulphuric acid arising from products of combustion upon cellulose materials.

The Salford gas has been burning here for some hours. I have the apparatus so arranged that the sulphurous acid produced, is arrested in the form of sulphuric acid. The solution is here. I will paint a sheet of paper with it, and dry it, showing you the result. As the solution dries, the acid becomes strong enough to char the paper, and to destroy it. It is the sulphur impurity which does this, carbon and carbonic acid will not do any such thing.

Coal smoke, then, produces about three millions of tons per annum of oil of vitriol, most of which is showered down upon us in the rain. This has certainly been going on in this proportion for the past twenty years, so that during this period we may estimate that over sixty millions of tons of oil of vitriol have fallen over the surface of the British Isles.

SIXTY MILLION TONS! Now let us form some idea of this quantity. There are many users of oil of vitriol in Manchester, and nearly the whole of it is made in the Bradford district. From the works there to the user's factory, a horse and man will be able to make three journeys a day with eighteen carboys each journey. From these data we shall find that to move this quantity of acid to a distance of two miles would require 3,700 horses and men, working every day for a year. To put it in another way—suppose a canal was cut in the soil, of a uniform width of twenty feet, what would its length have to be to hold the twenty years' production of sulphuric acid resulting from the use of coal as a fuel? To our astonishment we find that if the said canal was five feet

deep, its length would have to be more than 2,200 miles; or, in other words, a canal, twenty feet in width, five feet in depth, and 110 miles in length, would have to be provided each year, to hold all the strong sulphuric acid that would be produced from the combustion of the coal used in England. This quantity exceeds, by far, the whole of the vitriol specially manufactured in the British Isles.

We may now consider how the evils of smoke may be avoided, and I may at once say that I do not know of any practical method whereby the sulphurous acid can be satisfactory extracted from household smoke, when once the sulphur has been gasified. But the evolution of sulphurous compounds from fuel can be stayed during the process of combustion by a proper preparation of the fuel. Five per cent. of lime or chalk, added to slack or dross, consolidated with pitch and pressed into blocks, such as are now known as patent fuel, will prevent the evolution of the sulphurous elements. There is also a patent fuel in the market, consolidated by the use of silicate of soda, which will not give off sulphurous acid when burned. I have some of it here, and will place it on the fire for you to see.

Of course, such fuel would be a trifle more expensive than ordinary coal, but not much more, and we must consider that some sacrifice will have to be made by householders if we are to have a purer atmosphere. When the bulk of our towns have increased in size, when to use the Duke of Albany's words the evil has become "too grievous to be borne," when through inability to support themselves on smoke-begrimed farms, the agricultural population have swarmed the towns, then it may begin to dawn upon some of us, that it would be better to pay a higher price for our fuel, than to permit the depopulation of our residential suburbs and the depreciation of property occasioned thereby.

If the smoke evil continues, rents will continue to go down, while town rates will rise, and all those who can afford to live away will do so, but if the smoke and invisible sulphurous acid could be suppressed, town residences would be once more in request, suburban rents would rise, and our towns receive such a lease of prosperity that has never been known before.

Is not this an ideal, worthy of our utmost efforts?

Is not such an anticipation worth a little self-sacrifice on our part?

Let us now turn to the visible portion of the smoke. There are still the two conditions to deal with that I have already mentioned: (1) the smoke produced in lighting the fires and (2) that produced each time a new charge of coal is placed upon the remnants of the previous fuel.

For the first condition I do not know of any adequate remedy; to prevent smoke during the lighting up period would be very difficult, but it can be minimised in several ways. One method is to light the fire at the top, to which objection may be taken on the ground that it takes such a long time to burn through. Another method is to light the fire with gas-coke, using a blower for the time to increase the draught; while a third method is to minimise the number of lightings during the coal-burning season.

The second condition—that of preventing smoke when fresh fuel is put on to a fire—has been attended to for nearly a century.

Has it ever struck any of you, that in attending to an ordinary fire we operate in a direct contrary manner to burning a candle. Dr. Franklin in 1745 wanted householders to burn coal in their fires in the same manner as a candle burns, the cold fuel being below the burning portion. Nobody, however, looked upon Dr. Franklin's fire-cage as anything but a curiosity. In 1815 John Cutler obtained letters patent for a fireplace in which the coal was fed in below. Many grates were introduced on this pattern, but a firm of competitors questioned the validity of the patent on the pretence that the bottom of a kitchen range had previously been made to rise and fall; whereupon the law gave a decision against Cutler, who at once abandoned the matter in disgust. After this we have had Spencer's fire-cage and the Atkins and Marriott smoke-consuming grate, which embody all that has been done in more recent years. In fact, as early as 1816 it was foreseen that these special appliances, being out of the usual pattern and costly, could never meet with universal introduction. Dawson and Hawkins in that year patented a shovel for feeding in the raw coal *beneath* the glowing portion, and, I believe, this has been re-patented several times during the past 25 years. Dr. Arnott in 1854 took Cutler's grate as his standard. He improved it, and many were made of the new pattern; but servants had to be instructed, and hence the failure to introduce them. We may pass by the fire-places of Rumford, Jeakes, Marsh, Hoole, Young, Goodchild, and Taylor—names perhaps now forgotten by the modern race of fire-place inventors—with the exhortation to study what these men have done. All these schemes, even up to the present day, have not succeeded in turning a current of public feeling in favour of smokeless grates.

A single evening is too short a time for me to go into all the points that might be raised on this great question, but before I conclude, there are two aspects of the matter that deserve to be kept well before us. Smoke can be prevented by using a smokeless fuel, and any substantial nuisance may be prevented by the use of gaseous fuel, even the nuisance and injury arising from sulphurous acid. For household purposes, smokeless fuel may be particularised as anthracite coal, gas-coke and certain kinds of patent fuel, and there are three methods of burning it. Either of these fuels may be burned in the ordinary open fire-place, without the slightest trouble. In this very building to-night you will have an opportunity of seeing how easy it is to avoid smoke. In the exhibition we have a slow combustion stove that requires lighting but once in the season. The room you are now in can be heated in the same manner. In our offices you may be shown ordinary grates burning gas-coke, while a gas-fire in one office shows the care we have to take not to pollute the Manchester and Salford atmosphere. Slow combustion stoves of good pattern are the cheapest modes of heating and produce less smoke pollution than any other system I know of.

Slow combustion stoves do not enable us, however, to completely overcome the sulphurous acid nuisance and damage, nevertheless it greatly reduces the evil, as much less fuel is consumed to produce the same heating effect.

Practically, the whole of the nuisance now arising from the combustion of coal, could be stopped by the general use of coal-gas for cooking and heating. And here we may enquire what have our two great gas manufacturers, the sister corporations done to extend the use of coal-gas? Absolutely nothing! Worse still, the application of coal-gas, for purposes other than lighting, has increased in spite of the manufacturers of it. When coal-gas was only used for lighting, that is when the mains were only used at night, there was some excuse for keeping the day pressure low, but since the introduction of cooking by gas engines, warming offices by means of gas-stoves and other similar uses for the agent, the day consumption should be more carefully sought after and fostered. If the gas undertakings of the sister towns had been in the hands of private companies, the price of gas would by this time have been lowered to such an extent as to have allowed of a much more general use for heating purposes. Heating apartments by means of gas, even at 2s. per thousand feet, is still much more expensive than coal or coke, and thus a universal introduction of gaseous fuel is retarded.

I believe that if a company was formed to supply a heating gas (ordinary coal-gas) to Manchester and Salford at 1s. per thousand cubic feet, it would be a grand commercial success, but even though such a scheme could for ever free us from our smoke and fogs, I venture to prophesy that the fiercest opponent, the promoters would have to encounter, would be the corporations of these two places. The gas supply is now in their hands; encouragement should be given to keep the mains more fully worked during the day, whereby the gas profits would be increased and the atmosphere purified, to the benefit of all the inhabitants.

A discussion followed the reading of the paper, in which Mr. Alderman Bowes, of Salford, Mr. Councillor Worthington, of Manchester, Mr. Harry Grimshaw, Mr. Samuel Mellor, Mr. Forbes Carpenter, and Mr. William Thomson took part. A vote of thanks to the chairman terminated the proceedings.

THE BEHAVIOUR OF SUPERPHOSPHATES IN SANDY SOILS.

EXPERIMENTAL RESEARCHES ON THE ACTION OF VARIOUS SOILS ON THE PHOSPHORIC ACID OF SUPERPHOSPHATES.

MARNED THOMSON has made a series of experiments on the actions into which the soluble phosphoric acid of superphosphates may enter in various soils. Many points in connection with this question are still obscure. Although it is established that phosphoric acid can only be taken up by means of certain chemical compounds, yet the part played by each of the constituents of the soil in this reaction and the nature of the compounds which play the chief part in the absorption of this form of the nourishment of plants are ignored.

The author first of all directed his attention to the absorptive power of pure sea sand for phosphoric acid and then to that of sand mixed with weighed quantities of felspar, calcium carbonate and precipitated ferric oxide and aluminium hydrate; experiments were also made with mixtures of sand with calcium carbonate and felspar, and with calcium carbonate and a mixture of oxide of iron and hydrated alumina.

The sand was in every case mixed with the substances named above in such a way as to reproduce the natural conditions as closely as possible. Since the compounds absorbed by the soil are re-dissolved by the action of water containing salts in solution, the effect of common salt and of potassium nitrate on the phenomena of the absorption of phosphoric acid has also been investigated.

After a critical examination of the work previously carried out on the action of saline liquids on phosphates in various soils, the author describes his own experiments, made by the method of filtration.

The following are the conclusions arrived at:—

1. Pure sea sand does not at all prevent the complete removal of the phosphoric acid from superphosphate by pure water, or water containing common salt or nitrate; the extraction is most rapid when pure water is used.
2. Felspar alone added to sand is without effect on the absorption of phosphoric acid.
3. Calcium carbonate rapidly takes up soluble phosphoric acid, and this prevents diffusion; it is however necessary that the quantity present shall be more than that of the lime necessary to take up the available free phosphoric acid.
4. If the phosphoric acid be dissolved in saline liquids, much more calcium carbonate is required to produce the same fixation in the soil as when it is dissolved in distilled water.
5. The uniformity of the distribution of the phosphoric acid throughout all parts of the soil is of vital importance for the absorption of the acid by plants.
6. The sesquioxides of iron and alumina play an important part in the absorption of phosphoric acid, and form compounds which offer considerable resistance to the dissolving action of water and saline liquids.
7. When the precipitated sesquioxides and calcium carbonate co-exist in the soil, complete fixation takes place, and the compounds formed are very stable towards the solvents used.
8. Solutions of common salt of 1 and 2%, generally remove rather less phosphoric acid than does pure water under the same conditions; they also diminish the fixation of phosphoric acid by calcium carbonate; so long as the absorbing layer contains more than a certain minimum amount of the latter. This diminution is more marked with a 1% than with a 2% solution. A 1% solution diminishes the absorption of phosphoric acid by the hydrated oxides of iron and aluminium, whilst a 2% solution increases it in comparison with distilled water. Both solutions of salt diminish almost in the same degree the energy of combination of calcium carbonate, and the hydrated oxides with phosphoric acid when both are present. Finally, they dissolve out more of the phosphoric acid from the resulting compounds than does distilled water.
9. Solutions of potassium nitrate behave in a similar manner towards the phosphoric acid of superphosphate. They do not greatly diminish the fixation of phosphoric acid by the substances already mentioned, and even in this respect the 2% solution is generally more active than the 1%.

Most of the compounds of phosphoric acid formed in the soil are as easily dissolved and decomposed by potassium nitrate as by sodium chloride.

10. There is rarely a simple relation between the increase in the time of action of the solvent and the amount of phosphoric acid found in the solution.

Among other conclusions of practical value, the author emphasizes the fact that, even if all the other conditions are favourable, superphosphate cannot be expected to give a good result unless the sandy layer contains a certain quantity of calcium carbonate or a smaller quantity of this, together with oxide of iron and alumina dineminated throughout its mass; or if too much nitrate is either formed or employed in the soil since nitrates favour the solution of the phosphatic compounds of the soil.

If these conditions are not fulfilled, superphosphates should not be employed, or the necessary absorbents must be added.—Translated from *Beidermemuntial*.

BUTTER ADULTERATION.

THE French are taking steps to prevent the frauds which have been so common across the channel in the production and sale of butter which has been mixed with margarine. Speaking in the name of the Committee of General Demonstration, M. Gonville says that there are in France 7,000,000 cows, producing 75,000,000 hectolitres of milk, representing an annual value of 1,163,000,000f. He looks upon the dairy industry as the most important of all, and he regards the adulteration of butter as an act calculated seriously to interfere with this, the greatest of French industries. He says it may be urged that margarine is principally produced from beef suet, and that if the employment of suet is forbidden the meat trade will suffer; but he then pertinently adds that if suet were forbidden entirely the loss which would occur would, at the outside, be 5,000,000f., a sum which would scarcely be felt by the agricultural interest. "If," he says, "our farmers are not able to draw a portion of their income from the manufacture of butter, they will not succeed." The more milk there is produced the more cattle there will be raised. Without milk there can be few beasts, little meat, and consequently little fat. The production of milk, therefore, for butter-making affects the production of stock, and of the fat which is so largely used in the adulteration of the butter. He urges that some of the measures enforced in other countries should also be adopted in France, more especially the particular colouring of margarine and its mixtures, its commercial separation, the prohibition of margarine at the French frontier, and the strict carrying out of a very severe law. It is to be feared that, however stringent the law, the manufacture and consumption of margarine will not be prevented. It is undoubtedly the fact that it interferes with the greater sale and with the price of butter, and from the farmers' point of view its use therefore is to be lamented; but it is idle to expect that the general public, recognising an article of food as wholesome and obtainable, at a lower price than butter, for which it does ample duty, will not continue to purchase it in spite of all opposition. What we have to do is to protest against the adulteration of butter with margarine, or the sale of margarine as butter.

THE SEWAGE QUESTION AT ROCHDALE.

ON Monday, at a meeting of the Rochdale Town Council, presided over by the Mayor (Mr. W. T. Heap), a discussion took place respecting the Corporation's sewage farm, the settling tanks of which have just been completed, and inspected by about thirty members of the Council. The whole scheme has cost about £80,000.—Mr. H. SHARP said the scheme was working admirably.—Mr. Alderman TAYLOR said that as the Rochdale Corporation were now doing their share in preventing the rivers from being polluted, Local Boards and manufacturers ought to be called upon to do theirs.—Mr. ROBINSON wished it to be understood that the Corporation of Rochdale had, long before the formation of the Manchester Ship Canal, taken steps for the prevention of the pollution of the river Roach. They had spent an immense amount of money in perfecting their arrangements, besides what they spent on the sewage farm.—Mr. Alderman S. TWEEDALE (Chairman of the Paving and Sewering Committee) said deputations from that Council had visited sewage works in various parts of England, Scotland, and Wales, and had travelled thousands of miles and spent a great deal of money; but it had been a saving after all, for they had now a sewage farm and works of a very superior description. The deputation to Birmingham had seen a sight which they would not like to have seen at Rochdale, and he could mention a score of towns where the work had to be performed a second time. He and Mr. Platt, their borough surveyer, about a fortnight ago visited the works at Salford, and found that the scheme there being carried out was a great improvement upon that previously adopted. On his previous visit he could smell the stench for a quarter of a mile off; in fact it was most abominable. It was surprising that the Corporation of Salford could press on the authorities of other towns not to pollute the rivers when they themselves created a greater nuisance.

LOADING MATERIALS AND THEIR USES.

(SECOND ABSTRACT).

THE good qualities of china clay and annaline as loading materials, are united in asbestine, which is obtained from the fibrous, mineral *asbestos* (silicate of magnesia). This raw mineral is beaten and separated as much as possible from qauque or quartz, a process easily accomplished as asbestos is soft, and is sufficiently reduced to a fine fibre by rubbing. The grinding and sifting are more carefully carried out than in the case of gypsum. Only the best kinds of asbestos are used, as with these the paper may be highly loaded. This is due to the fact that asbestine is much lighter than gypsum. Placed under the microscope, the smallest particles appear as fine fibres which swim in the fluid, or cling to the fibre and lie firmly embedded in the paper. Without these properties, the fibres lose in suppleness, or have the same effect as china clay. As asbestine is very light, about 20% of it may be mixed with the pulp. When working the lower qualities, the finer fibres swim on the top side of the web on the wire cloth and remain on the top after the water is removed by the suction box, so that after glazing, this side is covered with a number of glistening particles. This effect is much more apparent, however, than in the case of gypsum, of which the greatest number of splinters remain buried in the mass, because it (gypsum) is heavier than the paper fibres. By choosing the best kinds this may be obviated, but they must be previously examined under a magnifying glass, by which the smallest particles appear as fine, short, dark needles of a uniform size.

Asbestine, of the best quality, may be worked up with a loss of from 5 to 9%. It is chiefly used for fine printing and writing papers, to which it imparts a pure white colour. Its absorptive power lies between that of china clay and gypsum, and, therefore, it is used for the better sorts of copper-plate paper. Although it does not absorb well, it possesses the power of forming free spaces in the paper by its own fine small fibres lying across and obliquely to the paper fibres, which drink in the printing colours. It may be used with advantage in all sized papers, because it does not itself absorb any size and the free spaces which it forms are filled with resin and resinate of alumina. It is only possible to load writing papers up to 20% with asbestine without interfering with the sizing.

Notwithstanding asbestine possesses so many advantages over clay and annaline, it must be observed that the strength of the paper is lowered by its use. The smoothness which paper prepared with asbestine assumes, is the same as when pure pulp is employed. When the paper is cut on the machine, the dust is less than where it is loaded with china clay or annaline. Owing to the small loss of asbestine on the paper machine, its cost as a loading is not much higher than china clay or annaline. The mode of adding it to the beater is simple and convenient. As it does not easily subside it can be added to the pulp as a powder before sizing. It distributes itself easily, and is fastened upon the fibre by the resin and resinate of alumina which separates.

Another kind of loading is known as *blanc fixe*, or precipitated sulphate of barium, which occurs in commerce in the form of a paste, and is chiefly used in the manufacture of special papers. These are distinguished by the highest pure white colour, and *blanc fixe* is used more to produce the tone than as a loading. Although it is in a very fine state of division, it is too heavy to be added to the paper in such quantities as the above-mentioned loadings. The pasty mass is simply mixed with water and poured amongst the pulp. A part of it deposits on the fibre, imparting to it a pure white colour, and if the fibre be only covered with a little *blanc fixe* it does not lose in strength as is the case with gypsum, clay, etc. The loss on the machine is very important, because all of it which does not cling to the fibre passes away with the water; it is so very finely divided. This loss may be reduced to a great extent by producing the *blanc fixe* in the beater by decomposing chloride of barium dissolved in water with alum. The right proportions are one part of chloride of barium and 2·6 parts of sulphate of alumina. Owing to the small amount of *blanc fixe* usually added to pulp, the paper appears less ragged in appearance than with the other loadings.

As the loss of the loading on the paper machine can be very considerable, it is necessary to accurately determine the amount of it in the paper. In the case of minerals this is easily done by burning and weighing the residue. After the paper is dried at 100° C., a known weight of it is rolled together so as to form a small tube around which a thin platinum wire is twisted in such a manner that the ash does not fall away. The paper roll is held upright over a clean dry dish and is then ignited with a gas flame. The paper tube acts like a chimney, whereby the products of combustion are rapidly carried away, and the paper quickly burns, leaving the ash or residue. This is then weighed and the percentage of loading calculated in the usual way.

The number of loading materials of organic origin is very considerable, as nearly all agricultural refuse is applicable for this purpose, as well as a series of waste materials from manufacturers. In exceptional cases some of them yield the necessary fibrous properties, but in most cases the raw material is so unequally conditioned that the greater part of it is beaten to powder during its treatment.

For the same reason, mechanical wood pulp used in so considerable quantities, can be only considered as a loading material. The individual particles of it do not twist under one another, and from mechanical wood pulp alone paper cannot be made. The individual particles are held together after drying by starch and size, and in bending the stronger sheets break. "Tangen-schliff" forms an exception to this, its fibres being somewhat longer. All contain incrusting substances, and their pliability is low like the strength of the papers prepared with such materials.

The advantage, which mechanically ground wood in the moist state has over china clay, lies partly in specifically lighter and much more bulky. The long fibres of the pulp twist around the single particles of ground wood, and when the mass is dried, these assume the smaller volume and the paper thus gains support from it. Moreover the paper is increased in volume by the addition of mechanical wood pulp. It feels more bulky than it would do were china clay used instead. Neither of these two materials is applied by itself. One replaces the other, and together, they form raw materials of very estimable value for the lower qualities of paper.

If paper cuttings and waste be included under the term "loadings," those are alone meant which originate from strongly sized and glazed papers. It is difficult to separate the single fibres, bound together by the size, by simple treatment in the Kollergang. Soft sized papers are more easily worked up, and are of course, not so much looked upon as a loading material. Waste of this description takes away the transparing of the paper as the fibres are ground to a meal. The fibres, filled with size and ground, have more similarity with the mineral loadings and reduce the transparency of the paper.

Tests to ascertain whether waste paper has been used as a loading are not possible, excepting the individual means of knowing whether the strength of the paper has been lowered. Solutions of sulphate of anilin or phloroglucins are easy and sure qualitative tests for mechanical wood pulp. Quantitive tests are much more difficult, as the determination is only indirect, and is based upon the fact that an alkaline copper solution dissolves the fibre; whilst ground wood is dissolved only after some time.

Starch may also be considered as an organic loading. It is used in solution and for the purpose of preventing the size (resin, etc.), and mineral loading from depositing. It is found in all sized paper, which is made hard and crisp by it. The hardness and crispness are increased in proportion to the amount used, and especially when dry starch is added as well as the starch solution. As much as 15% of starch may be added to paper without it suffering much less in strength. The loss of starch on the machine in such cases is very great, up to 60%. The qualitative test for starch with iodine solution is uncertain, as paper with 3% of starch gives as deep a blue colour as one with 15%. The chief means of quickly testing is simply the crispness of the paper.

If it be desired to exactly determine the amount of starch, the only available method is to convert it into sugar by boiling with dilute acids and titrating with copper solution.—*Papier Zeitung*, No. 76. September 21, 1890.

ABOUT NAPHTHA.—In the course of an inquest held recently Professor Boverton Redwood gave some interesting technical evidence with reference to naphtha. If naphtha, he said, was kept in an open or imperfectly closed vessel it evaporated in an ordinary temperature with great rapidity, and, mixing with ordinary air, formed a combination which was either inflammable or explosive, according to the proportions of vapour and air. According to the experiments he had made on a small scale he found that when the naphtha was spilled a pint might under favourable circumstances cover an area of about 80 square feet, and would evaporate under such circumstances at the rate of one pint in four minutes. During the evaporation of each pint the vapour would suffice to render 100 cubic feet of air explosive, or about three times the volume of air combustible. This vapour possessed great density. At common temperature the vapour of the naphtha was between three and four times the weight of air, and might thus flow unperceived for a considerable distance just as a liquid flowed, and upon coming into contact with flames immediately ignited, and, carrying back flame to the source of the vapour, caused the ignition of the liquid itself. Mr. Redwood then proceeded to demonstrate the inflammability of the vapour by an interesting experiment. He produced two glass vessels, one a large open one and the other an ordinary drug bottle. He placed about a quartern of naphtha in the bottle, and then held the neck of the bottle over the top of the glass vessel for a few seconds, but without allowing a drop of the naphtha to pass into the vessel. He then applied a light to the vessel, and there was instantaneously a brilliant burst of flames which completely filled the vessel and rose out of it.

THE USE OF TANNINS TO PREVENT BOILER CRUST.

By M. Leo Vignon.

THE form of deposit which is left in a boiler by the evaporation of the water is of considerable importance, as affecting the economy and safety of its action. When the residual matter is deposited, as a fine mud which can easily be removed, the boiler can be used more economically, lasts longer, and is safer than when the deposits form hard crusts on the sides, which can only be removed by knocking off with a hammer.

Chemical substances are largely employed to prevent the formation of such hard crystalline deposits, but it must be said that most of these are quite inefficacious, and are based upon erroneous principles.

It is quite irrational to apply a single solution or preparation in the same manner to prevent crust in boilers fed by waters of different composition. Some of these preventatives even can only exert their action at the expense of the material of the boiler itself.

Having been led to examine a number of mixtures sold for this purpose, I have found that many of them consist of aqueous solutions of tannin and sodium carbonate. One among them had the following composition per litre:—

Extract of sumac, 30°	260 cc.
Dry sodium carbonate	160 grms.

Sometimes the sumac extract is replaced by that of chestnut.

It is difficult to imagine what part the tannins can play in the prevention of boiler crust; but it appears, upon consideration, that, owing to their colouration, and the amount of extractive matter they contain, they are simply employed to disguise the real nature of the solution; they serve to complicate the analytical examination of the solution, and to puzzle any chemist sufficiently bold to wish to discover their secret.

It appears, however, from a chemical point of view, that the tannin can scarcely be without action on the plates of the boiler. If the tannin is free, its acid properties will lead to the solution of a certain amount of iron. In presence of carbonate of sodium, it is to be feared that it will absorb oxygen and lead to the oxidation of the iron.

Guided by these ideas, I made the following experiment:—

Five bits of iron plate, measuring 15 centimetres long, 5 wide, and 0·2 thick, were well cleaned and weighed:

No. 1	100·420 grms.
„ 2	94·450 „
„ 3	98·250 „
„ 4	103·450 „
„ 5	98·600 „

The following solutions were then made up in four porcelain basins:—

1.	Rhone water	1,500 cc.
2.	Extract of sumac, 30°	35 „
3.	Sodium carbonate	15 grms.
4.	Extract of sumac, 30°	35 cc.
	Sodium carbonate	15 grms.

Nos. 2, 3, and 4 were made up to 1,500 cc. with Rhone water.

Solution 2 was acid to litmus paper; solution 4, alkaline.

One piece of iron was retained for comparison, the other four being placed in the four solutions and boiled for four successive periods of two hours each, the bulk of the solution being kept constant by the addition of distilled water. Each plate was thus exposed to the boiling solution for eight hours.

At the end of this period the following observations were made:—

1. Rhone water.—The iron was slightly rusted; the bath contains a deposit of calcium carbonate, slightly tinted by oxide of iron.

2. Sumac extract.—Iron covered with a blackish coating possessing the properties of tannate of iron. The baths show a dark colouration.

3. Carbonate of sodium.—The iron has no trace of rust. The bath contains a slight deposit of pure white calcium carbonated, untinged by oxide of iron.

4. Extract and carbonate.—Iron covered with a slight film of tannate; solution very black.

The four pieces of iron were washed, brushed, rubbed with fine sand, and then dried and weighed.

		Weight.		
		Before experiment.	After.	Loss.
1.	Rhone water	100·420	100·370	·050
2.	Sumac extract	94·450	93·507	·934
3.	Carbonate of sodium	98·250	98·245	·005
4.	Sumac extract and carbonate of sodium	103·450	103·070	·380
5.	Original plate	98·600	98·590	·010

These results show with the greatest clearness:

1. That free tannin attacks the plates of a boiler.

2. That tannin associated with an excess of sodium carbonate has the same disadvantage.

3. That sodium carbonate has practically no action on the plates.

Solutions containing tannin should, therefore, on no account be used, as they tend to attack the boiler plates; whereas, sodium carbonate, added in the proportion found necessary by analysis of the water, presents no disadvantages whatever.—*Journal de l' eclairage au gaz.*

RECOVERING TIN FROM TIN-PLATE SCRAP.

By B. Schultze.

THE solvent action of acid ferric salts upon metals is well known, but the property has not hitherto been utilised in the treatment of tin-plate waste, for which purpose it answers perfectly. The solvent used may be either acid ferric sulphate, acid stannic sulphate, dilute sulphuric acid, or dilute hydrochloric acid, but in the two latter cases ferric hydrate, in the form of heavily-rusted scrap iron, must be added. The tin, when dissolved, is precipitated by metallic iron, for which purpose, however, the solution must be perfectly neutral, and contain only protoxide salts, as the smallest excess of acid in the presence of persalts prevents the reaction. This condition is obtained by passing the solution through a mixture of iron rust, metallic tin, and metallic iron, when the following reactions take place:—

(1) $Fe_2O_3\ 3\ H_2O + Sn\ O\ SO_3 + 3\ SO_3\ H_2O = 2\ Fe\ O\ SO_3 + Sn\ O_2\ 2\ SO_3\ 6\ H_2O$.

(2) $Sn\ O_2\ 2\ SO_3 + Sn = 2\ Sn\ O\ SO_3$.

(3) $2\ Sn\ O\ SO_3 + 2\ Fe = 2\ Fe\ O\ SO_3 + 2\ Sn$.

The process, as practised, includes three principal operations:—

1. The solution of the tin.

2. The precipitation of the tin.

3. The treatment of the waste liquor.

When acid ferric sulphate is used, the tin-plate cuttings are placed in iron baskets and lowered into the solution contained in an open wooden vat. The tin covering is completely stripped off the iron in a very few hours. The basket is then lifted out, the contents washed in water and picked over by hand to separate portions still covered with tin, while the remainder, which is clean malleable iron, is pressed into balls for the heating furnace.

The partially-stripped portions are either returned to the dissolving bath or put aside to rust, in order to obtain material for the neutralising vat.

When the solution is saturated, as evidenced by its no longer acting upon fresh tin-plate scrap, in which condition it contains mainly stannous and ferrous sulphates, probably a little stannic oxide and some free acid, it is passed to the neutralising vat containing metallic tin and iron rust, where the excess of acid is neutralised and the persalts are reduced as shown above.

When an acid stannic solution is used, the method of proceeding is similar, the only difference being in the nature of the solvent. Instead of these solutions, dilute sulphuric or hydrochloric acid may be used in conjunction with ferric oxide or its hydrate, but with these the action is somewhat slower, from six to twenty-four hours being required to remove the tin completety.

The precipitation of the tin from the neutral stannous solution is effected by running it into vats containing clean metallic iron (scrap previously freed from tin). The reaction goes on slowly, the tin separating as grey metallic powder or in brilliant crystalline grains; but the reduction is complete, the exhausted solution showing not the slightest trace of tin. The precipitate when washed and cleaned from iron by dilute sulphuric acid, is either melted or used for making tin salts. The green vitriol liquors from the precipitating vats are concentrated by allowing them to drop slowly over a large heap of cleaned iron scrap, which causes a rapid evaporation and a deposit of ferrous sulphate on the metal. This may be washed off and purified as commercial copperas by re-crystallising, or it may be used for forming the acid liquor for dissolving fresh quantities of tin.

When the tin-plate cuttings are varnished, the surface is cleaned by heating them with strong sulphuric acid at a temperature of 100 deg. Centigrade, which destroys the varnish in a very short time, leaving the tin surface exposed. When zinc is present, it should first be removed by treatment with dilute sulphuric acid as long as hydrogen is evolved.

The plant and materials required are both simple and inexpensive. From 1 to 6 cwt. of chamber acid, worth from 1s. to 12s., are consumed per cwt. of tin obtained, worth £4. 10s. to £5., in addition to 25 to 40 cwt of iron, worth from £1. 17s. to £4. The amount of coal required is inconsiderable. Both tin and iron are obtained in the highest state of purity.—*Dingler's Polytechnische Journal.*

NOTICE.

WE have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

THE CHEMICAL UNION.

THE United Alkali Company, Limited, has been registered by H. Forshaw and Hawkins, Liverpool, with a capital of £6,000,000. Object, to carry on business as manufacturers of chemical products and drugs; to carry on business as colliery owners and rock salt proprietors, miners, brine owners, and white salt manufacturers; to carry on business as dyers, drysalters, and manufacturers of dyes, stains, colours, varnishes, paints, and pigments; to carry on business as manufacturers of manure, soap, paper-pulp, paper, glass, bricks, pottery, terra cotta, and sanitary and disinfecting preparations, coke, cement, and artificial stone; to carry on business as waterproofers, india-rubber and leather manufacturers; to carry on business as millwrights, makers of locomotive engines, wagons and rolling stock, stone and limestone quarry proprietors, lime burners, owners of mines of all descriptions, and winners and workers of minerals and mineral oils and the business of preparing mineral substances for sale or for treatment in manufacturing processes; to carry on business as metallurgists in all its branches; to manufacture and supply gas to the property of the company or the neighbourhood, and, in connection therewith, to carry on the business of a gas-works company; to carry on any business directly or indirectly connected with the generation, accumulation, distribution, supply, or application of electricity. The first subscribers are:—

	Shares.
J. Brock, Widnes	1
H. Gaskell, Widnes	1
J. K. Huntley, Flint	1
C. Wigg, Liverpool	1
J. H. Dennis, Liverpool	1
A. W. Allhusen, Gateshead, Durham	1
J. E. Davidson, Newcastle-upon-Tyne	1
C. E. Barlow, Widnes	1
J. C. Stevenson, M.P., South Shields	1
J. Tennant, Saltwell, Gateshead	1
G. L. Wigg, Runcorn	1
P. J. Worsley, Bristol	1
J. A. E. Rayner, St. Helens	1
E. K. Muspratt, Dale-street, Liverpool	1
W. J. Menzies, St. Helens	1
H. Gaskell, jun., Widnes	1
R. Shaw, Widnes	1

There shall be an honorary president of the company, and four honorary vice-presidents. Sir Charles Tennant, Bart., shall be the first honorary president, and Sir Edward Sullivan, Bart., Holbrook Gaskell, John K. Huntley, and James Hawke Dennis vice-presidents. The qualification of every such officer shall be the holding of £5,000. shares in the company. These honorary officers shall (ex-officio) be directors of the company. Until otherwise determined there shall not be less than nine nor more than twenty directors, exclusive of the ex-officio directors above mentioned, and exclusive of managing directors. The first are John Brock, chairman; Charles Wigg, vice-chairman; J. C. Stevenson, M.P., vice-chairman; Thomas Alexander, Glasgow; A. Allhusen, C. E. Barlow, E. Baxter, J. E. Davidson, H. Gaskell, jun., James Gaskell, W. J. Menzies, E. K. Muspratt, G. Pilkington, J. A. E. Rayner, R. Shaw, James Tennant, G. L. Wigg, and P. J. Worsley. Qualification, £1,000. Remuneration: Chairman, £2,500, with further £500. after 8 per cent. dividend on the Ordinary shares; remuneration of each of the other directors, £400, one-half of which shall be paid irrespective of his number of attendances at board meetings, and the remainder to be decided at the end of the year, according to the number of their respective attendances.

Trade Notes.

A GUM SUBSTITUTE.—Sulphurous acid is now being used to act upon starch under pressure and at a high temperature. The product, after neutralization, is Schumann's universal gum, which is soluble and extremely adhesive, and closely resembles gum arabic, which is now very scarce and dear.

HOURS OF WORK.—The "Journal de l'Eclairage au Gaz" mentions a case where the workmen on a twelve-hour shift from 6 to 6 asked for a change from this to the hours of 12 to 12. The reason alleged for this was that day sleep was not satisfactory, and the men had gardens and wanted to spend an hour or two there. The request was granted, and the thing has worked well up to this.

A GERMAN CHEMICAL WORKS.—The chemical works of Ed. Pfannenschmidt, in Danzig, worked up 1,500 tons of gas-purifying residue last year for sal ammoniac and sulphocyanides, recovering 68·45 tons of the former and 16·6 tons of the latter. It also worked up 1,839 tons for Prussian blue and sodium ferrocyanide, recovering 36·85 tons of the former and 37·4 tons of the latter.

TO CLEAN TOOLS AND MACHINERY.—To clean iron parts of machinery, tools, etc., about 10 grammes of paraffin chipped fine, are added to one litre petroleum in a stoppered bottle, and during two or three days from time to time shaken up until the paraffin is dissolved. To apply it, the mixture is well shaken, spread upon the metal to be cleaned by means of a woollen rag or brush, and on the following day rubbed off with a dry woollen rag.

EXPORTATION OF CUBAN MANGANESE.—It is announced that during the month of August, 5,200 tons of manganese were exported from St. Jago de Cuba. Owing to the ready sale the manganese meets with in the United States its production is fast increasing, and the exports for September will be larger than ever before. The owners of the mines have formed a syndicate to work themselves, some American companies which first undertook to work the mines having failed to fulfil their contracts. The exports of manganese ore from July 1st, 1889, to June 30th, 1890, amounted to 2,240 tons, and from July 1st, to August 20th, 1890, to 4,190 tons. In other words, the Cuban syndicate exported more in 51 days than American contractors did in one year.

PETROLEUM WELLS OF GERMANY.—The statutory meeting of the shareholders in the Petroleum Wells of Germany Syndicate was held last week at Winchester House, Old Broad-street, London. Sir Seymour Blane, who presided, said the Company was registered on July 1st, and the first allotment was made on the 9th of the same month. The extent of the property was to be 270 German acres, and the price was 20,000. Two borings were now going on. One had gone down seven metres and the other 461 metres. They had abandoned the old well, which was the test well of the property, and had adopted a new system of boring. In reply to questions, the Chairman stated that in the present borings oil had not yet been struck. In the old borings oil was found at a depth of 143 metres. Nearly all the shares had been taken up.

ESPARTO AND POLLUTION.—At the recent meeting of the British Medical Association in Birmingham, Dr. Tesh offered a few remarks on the pollution of water courses by paper mill refuse. It was his opinion that the most disagreeable results arose from the waste products of mills using large quantities of esparto, the least damage and annoyance being caused by those mills where cardboards, browns, and other common makes were manufactured. He considered, however, that the liquid waste products arising from the cleaning of rags and other waste materials, was far more obnoxious than either of the others. His conclusion, after a serious study of the matter, was that an evaporator should be used to recover the bulk of the waste, and thus minimise the danger of turning such deleterious matters into a running stream. Such a course of treatment was essential both from an economic and a hygienic standpoint.

EXPLOSION AT BURY.—An explosion occurred last week at the chemical works of Mr. Mucklow, Bury, resulting in injury to three young men, and considerable destruction of property. In the filter rooms of the works are two sets of copper cylinders, egg-ended, three in a set, used for extracting colouring matter. About 7-30 one of the centre cylinders suddenly exploded, it is thought through being overcharged with water. The cylinder was blown to pieces, part of a wall was knocked down, an iron pillar supporting the room above was broken, the flooring of the storeroom above was blown away, and considerable other damage was done. Of the four men working in the room, George Whittaker, of Brook-street, sustained a compound fracture of one of his legs; John Sandhurst, of Baker-street, had one of his legs fractured above the knee; and Edward Shorrocks, of Ainsworth, had one of his feet injured. A youth, John Dagnall, was blown across the room, but was not injured. Whittaker and Sandhurst were taken to the hospital, and Shorrocks was sent home.

MANGANATE OF SODA.—At the usual weekly meeting of the members of the London County Council last week, held at the County Hall, Spring Gardens, Charing Cross, Sir J. Lubbock, Bart, M.P., presiding, one of the committees said the chemist to the Council had reported that during the past summer there had been used in deodorising the sewage 1,654 tons to manganate of soda, and 749 tons of sulphuric acid, at a cost of £24,560. 18s. 1d. The cost for similar operations in the year 1889 was £25,305. In order that the most advantageous terms might be obtained from contractors, who could work to better advantage when ample notice was given, the committee recommended: "That an advertisement be issued, inviting tenders for the supply of 1,500 tons of manganate of soda of 30 per cent. quality, and 1,000 tons of sulphuric acid, during the summer of 1891." This was agreed to.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

There has been a good week's business done in chemicals, both for home and export, and prices all round are firm. Bleaching powder steady at £5. 15s. to £6., softwood, rails, and £6. 5s. to £6. 10s., hardwood, f.o.b. Soda ash rather scarce for spot delivery, but no material change in price has occurred. We quote caustic 1⅜, carbonates 1½d. per deg. f.o.b. Caustic soda keeps in good demand for prompt and early delivery. The prices for this month have been fixed by the Chemical Union on the basis of £11. 10s. for 70% f.o.b. Saltcake dull at 40s., makers works. Soda crystals in moderate request at £3. 2s. 6d. to £3. 5s., rails. Chlorate of potash unchanged. Sulphate of copper somewhat weaker, for prompt delivery £18. 10s. to £18. 15s. may be taken as its full value. Lead salts do not improve, although litharage continues to sell at advanced prices. Vitriol is scarce, and good prices are being paid. Acetates of lime are selling better on the spot, and prices generally have slightly improved. We quote for prompt brown £7. 15s; grey, £13. Acetic acid quiet, and without change in price. Carbolic acid neglected. Caustic and carbonate of potash brisk, and prices are well maintained. Bichromates of potash and soda in good demand at former prices. Prussiate of potash firm at 10d. per lb.

TAR AND AMMONIA PRODUCTS.

Benzole is much quieter, and though this year's delivery is easily saleable at about 4s. 7½d. for 90's, and 3s. 7d½. for 50/90's, yet for next year's delivery consumers seem to hold back. Solvent naphtha and creosote continue in good demand, while anthracene is a little easier, 30% A being 1s. 5d. to 1s. 6d. per unit and 30% B 1s. 1½d. The pitch market is a trifle firmer, and last week's prices hold good now.

The sulphate of ammonia market keeps very dull, and in the absence of any consumptive demand prices are gradually giving way. The highest value at Hull to-day is £11. 6s. 3d, and at Leith and Liverpool some business is reported at £11. 5s. 0d. It is probable that in view of the receding nitrate market, consumers will hold off for some time yet and as in such a case dealers and speculators would be the only buyers in the market, it is to be feared that the downward course of sulphate values will remain unchecked. The agent of the Gas Light and Coke Co. still quotes £11. 12s. 6d., though it is improbable that any business is being done at this price, and outside London makes are correspondingly lower than at this time last week.

REPORT ON MANURE MATERIAL.

There has been more activity in the market during the past week, and considerable business has been done, but at prices in favour of buyers.

For hot-air-dried Charleston River phosphate rock, 11d. per unit continues to be paid, c.i.f. to U.K., but the value of land rock cannot be quoted as over 10d. per unit. Canadian Rock, 70% is worth scarcely 1s. per unit, buyers being now pretty well supplied with this grade of phosphate. Quotations for Somme and Belgian remain without change, but some concession, no doubt, would be made for any important quantities.

We do not hear of any business in River Plate Bones, and value now can hardly be put higher than about £5. 7s. 6d., delivered U.K. ports. Further business has been done in East India bone meal at £5. 10s. per ton, ex-quay, and that is closing value for shipment ahead. For crushed bones something less would be taken, and it is understood that business has been done at a price not reported. Common grinding bones are worth £4. 17s. 6d. to £5. per ton, according to quality and condition, ex-quay Liverpool.

Nitrate of soda is very quiet at 8s. per cwt. for ordinary quality, 8s. 3d. for refined, on spot. Due cargoes are worth about 8s. to 8s. 1½d. per cwt., and October—November shipments about 8s. 3d. to 8s. 4½d. per cwt., according to size and quality.

There is nothing fresh to report in dried blood. For River Plate nitrogenous material there is more enquiry, and any sales made have been at very full prices.

Superphosphates continue very firm at 50s. per ton, in bulk, delivered f.o.r. at works, for 26%.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron rather higher. Scotch warrants closed at 52s. 6½d. cash and 52s. 10d. one month. Middlesbrough, 48s. 11d. cash; hematite, 59s. 4d., cash. Copper steady. Chili bars, G.O.B.'s and G.M.B.'s closed at £57. 15s. to £58. 2s. 6d. cash, and £58. to £58. 7s. 6d. three months. Tin firm: Straits closed at £97. 2s. 6d. to £97. 12s. 6d. cash, and £96. 5s. to £96. 15s. three months. English ingots, £99. to £99. 10s. Lead quiet; Spanish, £14. 5s.; English, £14. 10s. Silesian Spelter firmer; ordinary, £25. to £25. 2s. 6d. Quicksilver, first hands, £10.; second hands, £9. 17s. 6d. Copper shares: Cape, 4⅛; Mason and Barry, 7 5/16 to 7¼; Namaqua, 2⅞; Rio Tinto fell ¼ to 24.

GLASGOW, WEDNESDAY.—Market easier, with a moderate business. Scotch done at 52s. 9d., 52s. 5½d., and 52s. 8d. cash, also at 53s., 52s. 8½d. and 52s. 11d. one month; closing buyers at 52s. 8d. cash, sellers ask ½d. more. Middlesbrough done at 49s. 1½d., cash and one month; closing with buyers at 48s. 11d. cash, sellers ask 49s. Hematite done at 59s. 3½d. cash, also at 59s. 6d. and 59s. 7d. one month; closing buyers at 59s. 4d. cash, sellers ask 59s. 6d.

WOLVERHAMPTON, WEDNESDAY.—The satisfactory position disclosed by the Cleveland ironmasters' returns for October, combined with the improvement in the Scotch warrant market, has imparted confidence to the Midland iron trade, and there was therefore a more cheerful feeling on 'Change this afternoon. Pigs were a little firmer than last week, cinder sorts being quoted 45s., and part mines 47s. 6d. In manufactured iron the home demand is a little better. Sheets, singles, are £7. 10s., and marked bars are firm at £8. 10s. Hoops remain £6. 15s.

THE LIVERPOOL COLOUR MARKET

Continues to rule steady, without any alteration in prices. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire: common, 40s, medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish. Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt, Prepared oxide, 10s 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

On the whole, the market here is decidedly weaker in most of the ordinary lines, except bleaching powder, perhaps, which is reported as very firm, and the bulk of business passing is limited only. The advent of the United Alkali Co. (Limited) has to be admitted by the most sceptical now, but until the appearance of the prospectus there is nothing but uncertainty as regards the administration of affairs—how it is to be done, and how it will finally affect divisional managements and staffs. A few contend that the "Union" for some months will be but tentative in character, and that, failing certain things, the door will be found conveniently open for a resumption of the *status quo ante*. The sulphate of ammonia market, partly owing to the fall in nitrate, is exceptionally languid, and it seems substan-

tiated (although at first discredited) that £11. 5s. has been taken. Sellers to-day are all willing to part at £11. 7s. 6d., and some no doubt would be tempted strongly by offers of £11. 6s. 3d., if not lower. Caustic sodas have continued rather on the fall still; but the descent of the week is not serious, and most probably there will be a halt now. There is no change in paraffins, unless to the extent of a very slight bettering on the part of burning oils, due to petroleum reports from America. Bichromates, as before, are somewhat idle. Chief prices current are: Soda crystals, 56s. 6d. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 5%, Tyne; caustic soda, white, 76°, £13. 5s., 70/72°, £11. 3s. 9d., 60/62°, £10. 5s., and cream, 60/62°, £9. 15s., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £7., and 1 cwt. casks, £7. 5s., net Tyne; refined alkali, 48/52°, 1⅝d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £6., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5⅜d., less 5% any port; nitrate of soda 8s. to 8s. 3d.; sulphate of ammonia, £11. 5s. to £11. 7s. 6d. f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18. 10s., less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb; paraffin wax, 120°, semi-refined, 3⅝d. to 3¾d.; paraffin spirit (naphtha,) 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 5,800 bags.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market during the past week has been quiet. Considerable sales of bleaching powder have been made for next year at £6. 5s. per ton, and some makers are reported as having the whole of their allotted quantity sold at this figure. No little excitement was caused on 'Change to-day when it became known that the Union had advanced the price of this article for next year's deliveries ten shillings per ton, making the price for softwood casks £6. 15s., and hardwood casks £7. per ton. There is no change to report in other products, the market now being wholly controlled by Union prices.

The manufacture of caustic soda has been recommenced at the Tyne Dock works of the Jarrow Chemical Company.

The following are the market quotations for deliveries up to end of present year:

Bleaching powder, in softwood casks, £6. per ton, less 3½%, hardwood casks, 5s. per ton extra. Caustic soda, 77%, £12. 5s. per ton, nett; ground and packed in 3-4 cwt. barrels, £16. per ton, nett. Soda ash, 48/52%, 1⅜d. per degree less 3½%; white alkali, 1⅝d. per degree, less 5%; soda crystals, 56s. per ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; ground and packed in casks 53s. per ton, less 3½%; recovered sulphur, packed in 2 cwt. bags, £4. 10s. per ton, nett; chlorate of potash, 5½d. per lb., less 5%; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

The market for Durham small coals is very steady at 7s. to 7s. 6d. per ton. Northumberland steam small offering as low as 5s. 6d. per ton, delivered into craft, and prices range from this figure up to 6s. 6d. per ton for first-class qualities.

The following are the exports of chemicals from the Tyne for October, 1889 and 1890:

	1889.	1890.
Alkali and Soda Ash	1,284 tons.	1,547 tons.
Bicarbonate of Soda	19 ,,	—
Bleaching Powder	1,793 ,,	2,788 ,,
Manure	1,459 ,,	2,000 ,,
Soda Crystals	1,547 ,,	866 ,,
Sulphate of Soda	208 ,,	307 ,,
Caustic Soda	1,909 ,,	852 ,,
Other chemicals		1,444 ,,
	8,219 ,,	9,804 ,,

Bicarbonate of soda has not been manufactured on Tyneside since the early part of the present year.

THE LIVERPOOL MINERAL MARKET.

The firmness reported in our market last week has been fairly well maintained in most minerals. Manganese: Arrivals have somewhat improved; the enquiry, however, has kept full pace with them, and prices are firm all round. Magnesite: Stocks continue very large, with few sales. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £11. Bauxite (Irish Hill brand): The increased demand continues, prices are very strong at—lump, 22s.; seconds 18s.; thirds, 14s.; ground, 35s. French chalk: Whilst arrivals this week have fallen off, the demand has increased very much, and prices are considerably stronger, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate easier; sulphate still strong at firm prices; "Angel White," No. 1, 70s: No. 2, 60s to 65s; No. 3, 45s. Pumicestone: Lump unchanged; ground easier. Iron ore: Native production in fair demand, at full figures, also Spanish and Bilbao; manganiferous in request, and prices firm. Santander, 9s. to 10s. 6d., f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore steady. Emerystone: best brands scarce and bringing top figures—No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; finer impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal continue in fair demand—prices rather stronger. Chrome ore: Higher grades more inquired for, and bringing good prices. Antimony ore and metal maintains the strong demand at full prices. Asbestos in strong demand, especially Canadian rock. Potter's lead ore: "standard" brands in request; smalls, £14 to £15.; selected lump, £16. to £17. Calamine: Good qualities in demand at advanced prices. Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, steadier. Plumbago: Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, scarce on spot—20s. to 22s. 6d. Ground mica, £50. China clay: Easier; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), inquired for, finest quality, 22s.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Manufacture of Bricks. E. Cammiss. 16,633. October 20.
Electric Meters.—(Complete Specification.) S. C. C. Currie. 16,653. Oct. 20.
Compositions for Oilcloth, Varnish, etc. S. Banner. 16,654. Oct. 20.
Improved Joint for Drain and other Pipes. T. Robertson and W. E. H. Wood. 16,656. October 20.
Automatic Sticking. J. Hilton, E. Jackson, and G. C. Hilton. 16,662. Oct. 20.
Yellow Colouring Matters. J. R. Geigy. 16,666. October 20.
Boilers. T. Read. 16,669. October 20.
Treatment of Soda Waste. F. Ellershausen. 16,676. October 20.
Ventilation of Sewer Shafts and increasing Draughts in Chimneys. W. H. Mansbridge. 16,678. October 20.
Refrigerating Air and Evaporating Liquids. W. H. le Mesurier 16,679. October 20.
Treatment of Cupreous Materials. P. G. Biron. 16,685. October 20.
Treatment of Boiler Feed Water.—(Complete Specification.) F.G. Fowler. 16,686. October 20.
Refrigerating Apparatus.—(Complete Specification). R. A. Messervey. 16,688. October 20.
Extraction of Gold and Silver. J. Harris. 16,694. October 20.
Manufacture of Cast Iron.—(Complete Specification). J. B. Renshaw. 16,724. October 21.
Treatment of Sewage. George Edward Davis and Alfred Roland Davis. 16,728. October 21.
Manufacture of Coke and Gas. F. J. Jones. 16,738. October 21.
Dyeing Yarns, Tops, etc. W. Laidlaw. 16,751. October 21.
Electric Switches. T. R. Andrews and T. Preece. 16,752. October 21.
Burning Coal and Hydro-carbon Fuel.—(Complete Specification.) W. P. Thompson. 16,760. October 21.
Secondary Chambers for Boilers and other Furnaces.—(Complete Specification). W. P. Thompson. 16,761. October 21.
Steam-boiler Furnaces.—(Complete Specification.) F. G. Bates. 16,775. October 21.
Injectors. S. S. Dixon. 16,780. October 21.
Manufacture of Paints.—(Complete Specification.) W. A. Hall. 16,798. October 21.
Fertilizing Compounds.—(Complete Specification.) J. Patterson. 16,753. October 21.
Manufacture of Paper.—(Complete Specification.) H. H. Lake. 16,776. October 21.
Machinery for Making Fire-clay Ware. T. C. Fawcett. 16,811. October 22.

Ventilator for Delivering or Extracting Air. P. G. Ambler. 16,812. October 22.
Treatment of Sewage. J Lowe. 16,836. October 22.
Secondary Batteries. J. E. Douglas. 16,837. October 22.
Manufacture of Sulphuric Acid. C. Hope. 16,842. October 22.
Secondary Batteries. H. Weymersch. 16,844. October 22.
Distillation of Bituminous Fuel. F. E. Ross. 16,846. October 22.
Electric Switches. W. Lownds, E. Emanuel and J. Wood. 16,847. October 22.
New Blue Basic Dyestuff. J. Y. Johnson. 16,868. October 22.
Aluminium Fluoride and Double Fluoride. T. S. Lindsay. 16,887. October 23.
Electromotors.—(Complete Specification.) R. Kennedy. 16,889. October 23.
Electro-Coated Surfaces. W. Woodall. 16,901. October 23.
Manufacture of Paper. C. R. F. Schloesser and J. M. Campbell. 16,910 October 23.
Waterproof Fabrics H. Birnbaum and T. Birnbaum. 16,911. October 23.
Cocks for Mixing Gas and Air. R. Goehde. 16,912. October 23.
Steam Traps. J. Murrie. 16,925. October 23.
Straining Paper Pulp. H. B. Watson and J. S. Watson. 16,928. October 23.
Electric Battery. M. Azipas. 16,935. October 23.
Refrigerating Apparatus.—(Complete Specification). L. C. Riggs. 16,940. October 23.
Preparation of Material in the Treatment of Sewage.—(Complete Specification). F. P. Candy. 16,972. October 24.
Obtaining Vegetable Fibre. D. Barnett. 16,985. October 24.
Treatment of Kauri Gum.—(Complete Specification). J. C. Firth. 17,009. October 24.
Electric Meters. J. Lea. 17,035. October 25.
Extraction of Metals from their Ores. J. C. Mitchell. 17,036. October 25.
Injectors.—(Complete Specification). W. McShane. 17,041. October 25.
Apparatus for Cooling and Discharging Slag. W. Truran. 17,053. October 25.
Electric Switch. J. P. Bayley. 17,062. October 25.
Machinery for Hollow Earthenware. J. P. Guy. 17,068. October 25.
Distribution of Forced Draught in Furnaces. A. C. Auden. 17,086. October 25.
Dynamos. G. Pitt. 17,108. October 25.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

SLADEN AND DIXON, Stafford, brewers.
G. HARRISON AND C. W. HARRISON, under the style of W. Harrison and Son, Salford, lead merchants.
T. ROTHWELL AND SONS, Bolton, mineral water manufacturers, so far as regards T. Rothwell.
GOSS AND DAVIS, Bootle, cement dealers.
W ROUGHTON AND H. T. GRAVES, under the style of H. T. Graves and Co., Gainsborough, ærated water manufacturers.
H. JESSOP AND SONS, Fenay Bridge, near Huddersfield, chemical manufacturers, as far as regards J. Jessop.
C. GILLET, H. YOUNG, AND C. H. J. EMERY, under the style of Hipkin and Co., Emsworth, brewers and maltsters.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

MOORE, HARRIETTE (trading as the Portmadoc Mineral Water Co.), Portmadoc, late of Birkenhead and Borthygest, mineral water manufacturer, wife of W. H. Moore, trading apart from her husband.
MARKER, ROBERT HENRY, paint and colour manufacturer (trading as the Britannia Paint and Colour Co., Swansea.
NEWELL, CHARLES, Rochdale, mineral water manufacturer.

Adjudications.

CRABTREE, THOMAS AND CRABTREE, HENRY (trading as S. Crabtree and Sons) Failsworth, Dyers.
NEWELL, CHARLES, Rochdale, mineral water manufacturer.

New Companies.

ANTIMONY CONCESSIONS SYNDICATE, LIMITED.—This company was registered on the 25th ult., with a capital of £25,000., in £1. shares, to acquire mining properties in France or elsewhere, and to work and develop the same. The subscribers are :—

	Shares.
Wm. McDowell, 40, Lacon-road, Dulwich, secretary	1
Neil Morriss, Leytonstone	1
R. Thicknesse, 11, Abchurch-lane, solicitor	1
J. Simpson, Hampton-wick, merchant	1
T. H. Robinson, 16, Ockenden-road, N., clerk	1
H. W. Appleby, 4, Elizabeth-terrace, Leyton, clerk	1
L. Munden, 8, Prince's-road, Notting-hill, secretary	1

D. GLASGOW HUXLEY AND COMPANY, LIMITED.—This company was registered on the 23rd ult., with a capital of £1,000., in £10. shares, to trade as chemists, druggists, herbalists, and as oil and colour merchants, manufacturers of mineral waters, and as manufacturers of surgical, electrical, photographic and other scientific apparatus. The subscribers are :—

	Shares.
D. G. Huxley, 178, Cemetery-street, Sheffield, drug merchant	1
H. D. Huxley, 178, Cemetery-street, Sheffield, drug merchant	1
H. Barrow, Attercliffe, engineer	1
W. Bulty, Attercliffe, engineer	1
Isabella Huxley, 50, Pembroke-street, Sheffield, confectioner	1
Eliza Huxley, 50, Pembroke-street, Sheffield, confectioner	1
Mary Howison, 178, Cemetery-street, Sheffield, confectioner	1

HEYWOOD AND COMPANY, LIMITED.—This company was registered on the 25th ult., with a capital of £20,000., in £1. shares, to acquire the businesses of newspaper proprietors and public journalists, carried on by the following companies :—Heywood and Co., Limited, and the Textile Publishing Co., Limited, together with the copyrights owned by them of certain publications known respectively as the *Dyer, Calico Printer, Bleacher, Finisher and Textile Review*, and the *Textile World*. The first subscribers are :—

	Shares.
Dawson Rogers, Rose-villa, Hendon-lane, Finchley, clerk	1
W. Judd, Fern-bank, Lordship-lane, printer	1
F. W. Grant, London Press Club, Ludgate-circus, journalist	1
T. J. Smith, 428, New-cross-road, advertising agent	1
J. Hunt, 222, Upper Thames-street, paper merchant	1
C. A. Playford, 23, Richmond-terrace, Clapham-road, clerk	1
T. Heywood, Sidcup, journalist	1

ILLUMINATING, HEATING, AND POWER GAS COMPANY, LIMITED.—This company was registered on the 28th ult., with a capital of £15,000., in £10 shares, to acquire the business of Messrs. Hugh Williams, Hy. Andrew, and F. E. Townsend, at 23, John Dalton-street, Manchester, and at Askham-in-Furness, carried on under the style of the Illuminating and Power Gas Company. The subscribers are :—

	Shares.
H. H. Andrew, Sheffield, steel manufacturer	1
E. Andrew, Ashton-under-Lyne, cotton spinner	1
J. A. Hyde, Ashton-under-Lyne	1
E. Ashworth, Wilmslow, Chester, engineer	1
J. Ridyard, M.E., Little Halton	1
F. E. Townsend, C.E., Heaton Chapel	1
H. Williams, C.E., Stockport	1

INCORPORATED INSTITUTION OF GAS ENGINEERS.—This society proposes the advancement of the gas industry in all its branches. It was registered on the 27th ult., as a company limited by guarantee to £1. each member, the word "limited" being omitted from the title by Board of Trade licence, granted in pursuance of section 23 of the Companies' Act, 1867. Solicitors, Messrs. Field, Roscoe and Co., 36, Lincoln's-inn-fields.

L. COWAN AND SONS, LIMITED.—This company was registered on the 28th ult., with a capital of £100,000., in £5. shares, to take over the business of soap manufacturers and sugar refiners, carried on by the firm of L. Cowan and Sons. The subscribers are :—

	Shares.
John Cowan, Barnes, soap maker	1
H. D. Cowan, 15, Lancaster-gate, W., clerk	1
E. Williams, 10 and 11, Mincing-lane, colonial broker	1
Alderman Lt.-Col. Phineas Cowan, 15, Lancaster-gate	1
David Cowan, 11, Old-square, Lincoln's-inn, barrister	1
A. W. Williams, 10 and 11, Mincing-lane, colonial broker	1
Lewis P. Cowan, 15, Lancaster-gate, sugar refiner	1

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 25th.

Alum—
Holland, £118. Ohlenschlager Bros.
Acetic Acid—
Holland, 45 pks. A. & M. Zimmermann
" 50 Beresford & Co.
Antimony Ore—
Sydney, 8 t. Bk. of N. S. Wales
" 15
Portugal, 58 H. Emanuel
" 3 c. Knowles & Co.
Brimstone—
Italy, 5 t C. Tennant, Sons, & Co.
" 22 J. Kitchen, Ltd.
" 30 G. Boor & Co.
Bones—
Sydney, 8 t. Goad, Rigg, & Co.
" 1 Leach & Co.
France, 4
Bones—*continued.*
Fray Bentos, 41 t. Goad, Rigg, & Co.
Germany, 12 E. Willson
Barium Chloride—
Germany, £80. Petri Bros.
Bromine—
Germany, £110. A. & M. Zimmermann
Barytes—
Holland, 22 cks. W. Harrison & Co.
Germany, 23 J. Kitchen, Ltd.
Borax—
Germany, £56. F. Stahlschmidt & Co.
Caoutchouc—
Zanzibar, 108 c. L. & I. D. Jt. Co.
Singapore, 167 Huttenbach & Co.
E. Indies, 52 Petrocochino Bros.
Tamatave, 66 L. & I. D. Jt. Co.
Mauritius, 119 Hoare, Wilson & Co.
U. S., 52 Prprs. Bull Wf.
" 48 Mildred, Gogenechi, & Co.
" 16 Stiebel Bros.
Caoutchouc—*continued.*
Penang, 43 c. L. & I. D Jt. Co.
Colon, 2 Prop. Bulls' Wf.
Cream of Tartar—
Holland, 20 pks. Middleton & Co.
" 6 "
France, 4 M. Ashby, Ltd.
" 1 E. W. Carling & Co.
Italy, 24 Bacon & Co.
Carbonic Acid—
Germany, £100. T. H. Lee
Copper Ore—
Singapore, 2 t. Adamson, Gilfillan, & Co.
U. S., 230 c. R. M. S. P. Co.
Chemicals *(otherwise undescribed)*
Germany, £194. T. H. Lee
" 92 W. Burton & Sons
" 6 C. Lamb & Co.
" 570 A. & M. Zimmermann
" 124 T. H. Lee
Holland, 15 Phillipps & Graves
Chemicals *(continued).*
Holland, £20 H. Wallace & Co.
Germany, 24 A. & H. Greeff
" 610 A. & M. Zimmermann
" 155 Phillipps & Graves
Dyestuffs—
Indigo
E. Indies, 5 chts. F. Stahlschmidt & Co.
" 5 Benecke, Souchay, & Co.
" 11 W. Brandt, Sons, & Co.
" 7 Arbuthnot, Latham, & Co.
Holland, 2 cs. Phillipps & Graves
" 4 chts. "
E. Indies, 1 L. & I. D. Jt. Co.
" 26 "
" 14 Walker, Munsie, & Co.
" 10 L. & I. D. Jt. Co.
" 6 Arbuthnot, Latham, & Co.

Dyestuffs—*continued.*

Valonia

Smyrna,	47 t.	J. Graves

Tanners' Bark

Natal,	18 t.	Hicks, Nash, & Co.
Belgium,	3	Sawer, Mead, & Co.
Adelaide,	150	Baxter & Hoare

Extracts

Smyrna,	100 pks.	Boutcher, Mortimore, & Co.
France,	30	T. H. Lee
,,	140	Props. Chmbln.'s Wf.
Austria,	40	Hermann & Co.
U. S.,	250	T. Ronaldson & Co.
France,	280	L. J. Levinstein & Sons
Belgium,	50	,,

Babul Bark

E. Indies,	128 pks.	G. W. Wheatley & Co.

Redwood

E. Indies,	50 t.	Benekendorff & Co.

Sumac

Italy,	300 pks.	W. France & Co.
,,	100	Hicks, Nash, & Co.
,,	65	Beresford & Co
,,	100	R. Warner & Co., Ltd.
,,	250	G. Lewis
,,	650	J. Kitchen, Ltd.

Cochineal

Canaries,	33 pks.	L & I. D. Jt. Co.
,,	23	W. M. Smith & Sons
,,	8	Kuhner, Henderson, & Co.
Las Palmas,	14	Hammond & Co.
Canaries,	3	Johnson, Rolls, & Co.

Anthracene

Holland,	26 pks.	Burt, Boulton, & Co.
France,	32	,,

Gambier

Singapore,	501 pks	J. Swire & Sons
,,	687	R & J. Henderson
,,	842	W. H Cole & Co.
,,	243	Brinkmann & Co.
,,	419	W. A. Cole & Co.
,,	212	L & I. D. Jt. Co.
,,	892	Beresford & Co.
,,	229	W. H. Cole & Co.
,,	198	L & I. D. Jt Co.

Myrabolams

E. Indies,	19 pks.	L. & I. D. Jt. Co
,,	334	Marshall & French
,,	72	Hoare, Wilson, & Co.

Fustic

Spain,	38 t.	Churchill & Sim
Patras,	5	L. & I. D. Jt. Co.
Spain	38	Lewis & Peat

Argols

Italy,	1,017 pks.	B. Jacob & Sons
,,	100	Thames S. T. Co.

Saffron

Spain,	1 pk.	Brown, Wills, & Co.

Turmeric

E. Indies,	194 pks.	Matheson & Co.

Glycerine—

Melbourne,	£280	Grimwade, Ridley & Co.
France,	300	Ross & Deering
Germany,	125	T. H. Lee
,,	62	A. & M. Zimmermann
,,	60	Beresford & Co.
,,	70	Phillipps & Graves
,,	151	A. & H Greeff

Glucose—

Germany,	200 pks	200 c. R. G. Hall & Co.
France,	140	140 Barrett, Tagant & Co.
U. S.	125	693 Union Lighterage Co.
,,	50	304 Page, Son & East
Germany,	235	478 L. Sutro & Co.
,,	35	273 Propns. Scott's Wf.
,,	100	100 Botolph & Nich's. Whvs. Co.
Holland,	85	155 J. Barber & Co.
Germany,	15	118 M. D. Co.
U. S.,	50	279 Propns. Scott's Wf.
Germany,	300	300 J. Barber & Co.
,,	300	300 J. F. Ohlmann
,,	600	600 Trier, Meyer & Co.
,,	45	370 J. Knill & Co.
,,	10	75 J. Cooper
,,	35	210 L. Sutro & Co.
,,	20	170 Dutrulle, Soloman & Co.
,,	200	20 Baxter & Hoare
France,	1	4 J. Blank

Guano—

Uruguay,	400 t.	Anglo Cont. G. Wks.

Gutta Percha—

Singapore,	165 c.	Soundy & Son
,,	297	Huttenbach & Co.
Hong Kong	25	Lewis & Peat
Penang,	72	L. & I. D. Jt. Co.
Singapore,	211	R. & J. Henderson
France,	30	Flageollet & Co.
E. Indies,	265	Kaltenbach & Schmitz

Iron Oxide—

Austria,	£25	Anderson, Weber & Smith
Germany,	40	H. J. Perlbach & Co.

Isinglass—

N. Russia,	2 pks.	Magee, Taylor & Co.
E. Indies,	2	L. & I. D Jt. Co.
Penang,	3	,,
Singapore,	2	,,
Penang,	7	,,
Singapore,	12	,,
Jamaica,	3	W. M. Smith & Sons

Magnesium Chloride—

France,	£25	R. Johnson & Co.

Magnesia—

Holland,	£40	A. & M. Zimmermann
Germany,	100	A. Hunter & Co.

Manure—

France,	261 t.	Adam's Chem Manure Co.
Belgium,	138	D. de Pass & Co.
,,	120	Lawes Manure Co., Ld
,,	200	London Manure Co. Ld.
Germany,	50	F. W. Berk & Co.

Phosphate Rock

France,	2 t.	Cater, Paterson & Co.
Aruba.	292	G. M. Bauer
Montreal,	220	R. Hunter & Co.

Naphtha—

Holland,	31 drs.	Burt, Boulton & Co.
,,	1	Lister & Biggs
Belgium,	29	Stein Bros.
Holland,	107 pks.	Lister & Biggs
Germany,	10 cks.	Stein Bros.

Pearl Ashes—

France,	100 c.	F. W. Berk & Co.
Montreal,	42	Charles & Fox

Potash—

Montreal,	50 c.	Charles & Fox
France,	4 pks.	Spies Bros. & Co.
Germany,	£50	,,
,,	700 pks.	A. Hunter & Co.
Holland,	£65	R. Morrison & Co.

Potassium Bicarbonate—

Holland,	£78	A. & M. Zimmermann

Potassium Muriate—

Germany,	2,332 pks.	Anglo Contl. G. Wks.

Potassium Oxalate—

Norway,	£100	A. Hughes
Holland,	33	Peresford & Co.

Phosphate of Lime—

France,	£25	Carter, Paterson & Co.

Potassium Carbonate—

Germany,	24 pks.	M. D. Co.
,,	20	Beresford & Co.
France,	17	Charles & Fox

Potassium Sulphate—

France,	40 pks.	Weatherley, Mead & Co
Germany,	1,016	W. Montgommery & Co.
France,	13 cks	Weatherley Mead & Co.

Paraffin Wax—

U. S.	480 brls.	H. Hill & Sons
Germany,	49 cs.	,,
U. S.	150 brls.	G. H. Frank

Pitch—

Guernsey,		F. Cheesewright
France,		Path, Hille & Co
Sweden,	120	C. B. Leighton

Pyrites—

Spain,		Tennant Sons & Co.

Plumbago—

Holland,		Brown & Elmslie
Germany,	74	Prop. Scott's Wf.
,,	2	E. & G. Hisch & Co.
E. Indies,	90	J. Owen
,,	619	J. Thredder, Sons & Co.

Sodium Nitrate—

Germany,	£125	C. Faust & Co.

Sugar of Lead—

Germany,	7 pks.	Petri Bros.
,,	16	Beresford & Co.

Sodium Acetate—

Belgium,	£27	A. Zumbeck & Co.

Sulphur—

France,	£26	Vokins & Co, Ld.

Sodium Hyposulphate—

Holland,	£105	Beresford & Co.

Saltpetre—

Germany,	62 cks.	J. Hall & Co.
,,	142	P. Hecker & Co.
,,	200 bgs.	C Wimble & Co.
,,	100 cks.	T. Merry & Son

Stearine—

Holland,	6 cks.	J. H. Usmar & Co.
France,	116 bgs.	H. Hill & Sons
Belgium,	63	,,
,,	11 cks.	,,

Tartars—

Italy,	£340	Thames S T. & S. Co.

Turpentine—

U. S.	2,813 brls.	Nicholl & Knight

Tar—

N. Russia,	970 brls.	C B. Leighton
,,	2,039	W. F. Malcolm & Co.
,,	3,436	,,

Ultramarine—

Holland,	11 cs.	Haeffner Hilpert & Co.
,,	1 ck.	Ohlenschlager Bros.
Belgium,	10 pks.	Leach & Co.
,,	4 cs.	,,
Germany,	5	Phillipps & Graves
Holland,	10	Hernu Peron & Co.
,,	12 cks.	Seaward Bros.
Germany,	30 pks.	J. Kitchen, Ld.

Verdigris—

France,	2 pks.	Hodgkinson & Co.

Zinc Oxide—

Germany,	100 cks.	Williams, Torrey & Co.
Holland,	145 brls.	M. Ashby, Ld.
U. S.	100	,,
Belgium,	20 cks.	Ross & Deering

LIVERPOOL.

Week ending Oct. 28th.

Acetate of Lime—

St. Nazaire,	84 cks.	

Bone Ash—

Rio Grande,	204 t.	

Bone Meal—

Cadiz,	86 bgs.	

Boracic Acid—

Leghorn,	91 cks.	

Blood—

B. Ayres,	681 bgs.	

Cream of Tartar—

Bordeaux,	1 ck.	

Charcoal—

St. Nazaire,	460 cks.	

Caoutchouc—

Colon,	79 bls.	
Pernambuco,	71 brls.	
Addah,	6 cks	W. J. Podatz & Co.
,,	1 cs. 1	Melchers, Runge & Co.
,,	2	Pickering & Berthoud
,,	11	F & A. Swanzy
Accra,	67	J. P. Werner
,,	3	Davies, Robbins & Co.
,,	15	Pickering & Berthoud
,,	5	Hutton & Co.
,,	57	J. J. Fischer & Co.
,,	1	Edwards Bros.
,,	4	F. & A. Swanzy
Salt Pond,	1 2	C. Lane & Co.
,,	2 10	Pickering & Berthoud
,,	1	F. Schaeffer & Co.
,,	1 2	W. Griffiths & Co.
,,	2	Edwards Bros.
,,	1	F. J. Eaton & Sons
,,	1 4	Radcliffe & Durant
,,	1	A. Miller, Bros. & Co.
,,	1	W. B. McIver & Co.
C. C. Castle,	41	A. Miller, Bros. & Co.
,,	1 cs. 12	cks. Challenor & Co.
,,	2 5	F. & A. Swanzy
,,	2 3	W B. McIver & Co.
,,	4	A Millerson & Co.
,,	2	T. E. Tomlinson & Co.
,,	1 3	L. Hart & Co.
,,	1 1	Kinloch Campbell
,,	1 1	W. D. Woodin
,,	1	Radcliffe & Durant
,,	1	J. Smith & Co.
,,	1	C. Lane & Co.
,,	2 3	
Elmina,	1 brl.	J. M. Jeville
Bathurst,	3 bgs. 16	Cie Francaise, &c.
,,	9	A Cros & Co.
Parahyba,	3 2 brls.	S. Lilly & Sons
Ceara,	66	Leech, Harrison & Co.
,,	30	Bieber & Co.
,,	42	Rosing, Bros. & Co.
Rangoon,	258 bgs.	
Brazil,	902 cs.	
Para,	95	F. Snarez & Co.
,,	1,068	

Dyestuffs—

Alizarine

Rotterdam,	40 drms. 8 cks.	

Cochineal

Las Palmas,	4 bgs	Swanston & Co.

Divi divi

Hamburg,	224 bgs.	
Amsterdam,	124	Browne, Geneke & Co.

Valonia

Smyrna,	145 t.	Barry Bros.
,,	100 bgs	Zeroudachi Bros.
,,	137	

Cutch

Rangoon,	321 bxs.	

Sumac

Palermo,	100 bgs. 100 brls.	J. Ritchie
,,	2,157 275	
Catania,	25	

Fustic

Savanilla,	1,122 logs	G. Nilbull & Co.
Carthagena,	1,949 ps.	W. Goyeneche & Co.
Ceara,	qty.	R. Singlehurst & Co.
Savanilla,	2,060 lgs.	G. H. Muller

Argols

Bordeaux,	30 cks.	

Orchella

Lisbon,	6 bls. 7 bgs.	

Glycerine—

Havre,	200 cs.	
Marseilles,	7 drms.	R. J. Francis & Co.
Amsterdam,	40 cs. 25 crbys.	

Glucose—

New York,	2 brls.	Robinson & Allen
Stettin,	200 bgs.	

Horn Piths—

Rio Grande,	1,100	
Paysandu,	4,200	
B. Ayres,	23,200	Williamson Milligan

Isinglass—

Para,	8 cs.	W. Hooton & Yates

Manure—

Seville,	2 cs.	

Oxalic Acid—

Fredrikstad,	8 brls.	W. Caudery

Phosphates—

Montreal,	330 t.	

Pitch—

Antwerp,	6 cks.	
Bordeaux,	24	
Marseilles,	100 brls.	

Potash—

Rotterdam,	10 cks.	
Montreal,	10 brls.	C. H. Cunningham

Paraffin Wax—

Rangoon,	316 bxs.	

Sodium Nitrate—

Taltal,	6,845 bgs.	Shallcross & Higham
Iquique,	7,592	W. & J. Lockett

Sulphur Ore—

Huelva,	1,540 t.	Matheson & Co.

Soap—

Leghorn,	400 bxs.	Brown Bros. & Co.
Marseilles,	6 cs.	

Sulphur—
Catania, 40 bgs.
Stearine—
Bordeaux, 10 cs.
Philadelphia, 90 brls.
Tartar—
Naples, 1 ck. R. Parries
,, 2
Bordeaux, 12
Ultramarine—
Hamburg, 10 cs.
Verdigris—
Bordeaux, 2 cks.
Waste Salt—
Hamburg, 394 t.
Zinc Oxide—
Stettin, 25 brls.

HULL.

Week ending October 30th.

Acid *(otherwise undescribed)*—
Rotterdam, 1 bttl. W. & C. L. Ringrose
Alumina—
Rotterdam, 41 cks. W. & C. L. Ringrose
Barytes—
Rotterdam, 22 cks.
Antwerp, 42 A. Sandersen & Co.
,, 22 Sissons Bros. & Co.
,, 9
Bremen, 24 Blundell, Spence & Co.
,, 23 Tudor & Son
Cellulose—
Hamburg, 135 bls.
Chemicals *(otherwise undescribed)*
Antwerp, 58 pks. Wilson, Sons & Co.
Dunkirk, 11 cks. ,,
Stettin, 20 ,,
Bremen, 1 4 cs. Veltmann & Co.
,, 2 Wilson, Sons & Co.
,, 1 W. S. Merrikin
Dyestuffs—
Alizarine
Rotterdam, 17 cks. Hutchinson & Son
,, 2 W. & C. L. Ringrose
,, 19 Hutchinson & Son
,, 5 W. & C. L. Ringrose
,, 15 Hutchinson & Son
,, 30 pks. W. & C. L. Ringrose
Sumac
Trieste, 71 bgs. Wilson, Sons & Co.
Palermo, 1,395 ,,
,, 690
Indigo
Amsterdam, 2 chts. W. & C. L. Ringrose
Glucose—
Dunkirk, 100 bgs.
Stettin, 1,200 C. M. Lofthouse & Co.
,, 500
Glycerine—
Hamburg, 10 cs. Wilson, Sons & Co.
Amsterdam, 10 pks.
Kainit—
Hamburg, 508 bgs. G. Lawson & Sons
Nickel Ore—
Christiania, 103 cs. Wilson, Sons & Co.
Potash—
Hamburg, 18 cks.
Phosphate—
Ghent, 101 t. Wilson, Sons & Co.
Soap—
Bremen, 1 ck. C. A. Dreyer
Trieste, 2 cs. Wilson, Sons & Co.
Saltpetre—
Hamburg, 10 kgs. C. M. Lofthouse & Co.
Sulphur—
Catania, 2,257 bgs. 264 brls. Wilson, Sons & Co.
Stearine—
Antwerp, 26 bgs. Wilson, Sons & Co.
,, 12
Rotterdam, 10 Wilson, Sons & Co.
Soda—
Rotterdam, 3 cks. Reckitt & Sons
Sulphite—
Christiansand, 600 bgs. Wilson, Sons & Co.

GOOLE.

Week ending Oct. 16th.

Alum—
Rotterdam, 7 cks.
Antimony—
Boulogne, 1 ck.
Caoutchouc—
Boulogne, 2 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 55 cks. 4 cs.
Glucose—
Hamburg, 84 cks.
Dunkirk, 260 bgs.
Potash—
Calais, 28 cks.
Dunkirk, 46
Saltpetre—
Hamburg, 6 cks.
,, 4 brls. 40 kgs.
Rotterdam, 100 bgs.
Waste Salt—
Hamburg, 440 t. 1,235 cks.
,, 150 bgs.

TYNE.

Week ending October 29th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co

GRIMSBY.

Week ending October 20th.

Caoutchouc—
Hamburg, 7 cs.

GLASGOW.

Week ending October 30th.

Alumina Sulphate—
Rotterdam, 300 cks.
Alum—
Rotterdam, 7 cks.
Barytes—
Rotterdam, 46 cks.
Bleaching Powder—
New York, 110 bxs. Jamieson & Rae
Cream of Tartar—
Genoa, 10 cks.
Tarragona, 5 ps.
Copper Ore—
Huelva, 834 t. Tharsis Co., Ltd.
,, 1,780 ,,
Dyestuffs—
Alizarine
Rotterdam, 76 cks. 5 cs.
Sumac
Palermo, 3,156 bgs.
Glucose—
New York, 125 brls.
Glycerine—
Rotterdam, 3 drms. 2 cs. J. Rankine & Son
Oxalic Acid—
Christiania, 10 cks.
Paraffin Wax—
New York, 42 brls. 82 cs. H. Hill & Sons
Phosphate—
Montreal, 85 t. A. Cross & Son
,, 100 J. & P. Hutchinson
Stearine—
Rotterdam, 13 bgs. J. Rankine & Son
Tartaric Acid—
Palermo, 12 cks.
Ultramarine—
Rotterdam, 4 cks. J. Rankine & Son
Zinc Oxide—
Rotterdam, 25 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 22nd.

Acids *(otherwise undescribed)*—		
St. Petersburg,	200 cs.	£500
Acetic Acid—		
Auckland,	3 c.	£6
Adelaide,	29	26
Ammonia—		
B. Ayres, 2,210 lbs.		£34
Ammonium Carbonate—		
Sydney,	5 cs.	£10
Yokohama,	20 c.	38
,,	1 t.	38
Arsenic—		
Yokohama,	4 t.	£60
Ammonium Sulphate—		
Colombo,	6 t. 5 c.	£86
Treport,	22	255
Alum Cake—		
Rio de Janeiro,	123 c.	£23
Alum—		
Batoum,	20 t.	£120
Bisulphate of Lime—		
Calcutta,	29 c.	£29
Bones—		
Le Treport,	504 c.	£200
,,	355	140
Borax—		
Auckland,	6 c.	£8
Bisulphide of Carbon—		
Rotterdam.	102 c.	£65
Carbolic Acid—		
Marseilles,	8 t. 8 c.	£724
Rotterdam,	11 2	327
Copper Sulphate—		
Adelaide,	5 t.	£97
Antwerp,	12 cks.	18
Adelaide,	4 t.	78
Singapore,	1 9 c.	34
Cape Town,	20	19
Genoa.	10	220
,,	5	140
Caustic Soda—		
Melbourne,	9 c.	£14
Townsville,	2 t.	24
Adelaide,	12	128
Piræus,	5 16	124
Rockhampton,	4	12
Cream of Tartar—		
Adelaide,	10 c.	£55
Cape Town,	2	14
Rockhampton,	5 cs.	27
,,	20	107
Citric Acid—		
Rotterdam,	2 c.	£14
Sydney,	2 kgs.	14
Lisbon,	6 cks.	53
Cape Town,	6	42
Moscow,	20	145
Melbourne,	20	140
Sydney,	5	30
St. Petersburg,	20	145
Rotterdam,	3	18
Hamburg,	5	36
Coal Products—		
Pitch		
Madras,	20 rlts.	£10
Melbourne,	35 brls.	30
Antwerp,	130 t.	195
,,	120	180
Dieppe,	479	695
Marseilles,	1,100	1,485
Tar		
Oporto,	50 brls.	£20
Melbourne,	20 100 drs.	39
Calcutta,	25	25
Melbourne,	12	12
Kurrachee,	50 rlts.	54
Anthracene		
Dusseldorf,	61 cks.	£337
,,	192	1,350
Naphthaline		
Libau,	3 cks.	£18
Seville,	6	17
Calais,	19	191
Benzole		
Calais,	32 cks.	£678
,,	34	421
Yokohama,	5 drs.	13
Benzole- *continued.*		
Treport,	10 pns.	230
Rotterdam,	20	438
Pyridine Bases		
Hamburg,	83 c.	£160
Toluole		
Rotterdam,	30 cks.	£356
Chemicals *(otherwise undescribed)*		
Rangoon,	5 cs.	£18
Auckland,	26	70
Sydney,	3 pks.	30
Christchurch,	5 cks.	33
Rockhampton,	7	13
Cape Town,	3 pks.	38
Adelaide,	26	39
Bordeaux,	12	18
Melbourne,	10 kgs.	66
Adelaide,	6 pks.	13
Melbourne,	11 c.	30
Mangalose,	2	19
Disinfectants—		
Port Said,	4 pks.	£5
Suez,	7	10
Rangoon,	14 cks.	2
Campana,	7 c.	10
Hong Kong,	4 cs.	27
Guano—		
Bordeaux,	25 t.	£250
Barbadoes,	40	400
Glycerine—		
Cologne,	420 c.	£703
Horn Waste—		
Brussels,	242 c.	£48
Hydro Carbon—		
Brussels,	90 c.	£72
Ghent,	30 cks.	38
Manure—		
Bordeaux,	20 t.	£150
Oporto,	5	40
Mauritius,	20	160
Bordeaux,	14 15 c.	106
Orotava,	11 5	70
Oporto,	26	115
Cape Town,	362 t. 12 c.	2,609
Lisbon,	10 t. 17	56
Magnesium Sulphate—		
Brisbane,	9 t. 3 c.	£54
Magnesia—		
Seville,	17 pks.	£03
Nitric Acid—		
Jersey,	46 c.	£44
Phosphorus—		
Halifax,	12 cs.	£93
Potassium Chlorate—		
Yokohama,	300 kgs.	£658
Boston,	50 c.	119
Potassium Muriate—		
St. Vincent,	4 t. 15 c.	£38
Potash—		
Gothenburg,	3 kgs.	£11
Saltpetre—		
Rio de Janerio,	203 c.	£228
Santos,	17	19
Gibraltar,	5 t.	110
Rio de Janerio,	2 7	54
Santos,	6 14	153
Rio de Janerio,	39	44
Oporto,	221	225
Amsterdam,	147	150
Sheep Dip—		
Boca,	400 gls.	£50
New York,	2 t. 4 c.	112
Pt. Elizabeth,	166 pks.	95
Calcutta,	240 drs.	59
Pt. Elizabeth,	192 pks.	149
Durban,	80 drs.	63
Algoa Bay,	750	225
,,	6 t. 9 c.	212
Pt. Natal,	6	11
Sodium Bicarbonate—		
Bermuda,	40 c.	£15
Salammoniac—		
Amsterdam,	13 c.	£20
Sulphur—		
Algoa Bay,	50 kgs.	£27
Superphosphate of Lime—		
St. Vincent,	9 t. 5 c	£45

Soap Leyes—
Rouen, 11 t. 14 c. £370
Sodium Silicate—
Hobart, 86 c. £17
Sulphuric Acid—
Cape Town, 2 t. 5 c. £26
Tartaric Acid—
Rockhampton, 5 cs. £36
" 3 22
Bilbao, 10 c. 65
Sydney, 10 kgs. 70
" 2 12
Cape Town, 3 c. 18
Sydney, 3 20
Bilbao, 10 67

LIVERPOOL.

Week ending Oct. 25th.

Ammonium Muriate—
Philadelphia, 27 t. 1 c. 1 q. £614
Gefle, 1 1 1 31
Alum—
Oran, 1 t. 19 c. £10
Melbourne, 6 2 30
Batoum, 29 147
Calcutta, 13 12 1 q. 50
Madras, 8 41
Melbourne, 1 2 3 6
Smyrna, 12 5 62
Montreal, 4 10 23
Mersyne, 7 10 38
Dunedin, 1 1 7
Ibrail, 8 1 36
Philadelphia, 5 12 17
Ammonium Carbonate—
Barcelona, 6 c. £8
Stockholm, 6 3 q. 11
Genoa, 1 t. 1 34
Hamburg, 10 1 17
Ammonium Sulphate—
Valencia, 50 t. £600
Hamburg, 50 600
Bordeaux, 20 1 c. 240
Gr. Canary, 10 118
" 22 2 q. 263
New York, 100 8 1,194
Bordeaux, 5 1 57
Valencia, 75 10 899
Alum Sulphate—
Philadelphia, 5 t. 17 c. £29
Ibrail, 5 9 1 q. 20
Albumen—
Lisbon, 3 c. £30
Bleaching Powder—
Antwerp, 29 cks.
Boston, 262
Ferrol, 6 brls.
Genoa, 67
Hamburg, 144
Montreal, 156 21 tcs.
New York, 147
Philadelphia, 112
Antwerp, 14
Baltimore, 18
Boston, 217 172
Chicago, 50 brls.
Hamburg, 42
New York, 68 20 pks.
Rio de Janeiro, 10 cs.
Stettin, 28
Barytes Chlorate—
Venice, 6 c. £22
Borate of Lime—
Rotterdam, 10 t. 10 c. 3 q. £91
" 9 18 3 115
" 160 bgs. 114
Brimstone—
Montreal, 2 t. 14 c. 1 q. £14
Boracic Acid—
Antwerp, 7 t. 17 c. 3 q. £237
Rotterdam, 1 15 3 43
Borax—
Stockholm, 5 t. 2 c. £138
Amsterdam, 5 2 q. 9
Odessa, 18 28
Montreal, 5 cks. 16
Rotterdam, 12 85
Sydney, 2 t. 3 3 59
New York, 1 7 22
Caustic Soda—
Adelaide, 60 dms.
Alexandria, 16
Algoa Bay, 3 cs.
Almeria, 4 cks.
Antwerp, 54
Baltimore, 200
Barcelona, 15
Boston, 300
B. Ayres, 15
Calcutta 177
Carthagena, 25
Corunna, 20 brls.

Caustic Soda—*continued.*
E. London, 7 bxs. 12 brls.
Ferrol, 6
Ibrail, 36
La Guayra, 10
Madrid, 25
Messina, 130
Montreal, 194
New York, 240
" 110
Pasages, 11
Puerto Cabello, 20
Riga, 10
Rosario, 50
San Francisco, 10
Seville, 216 110
Sydney, 40
Tampico, 100
Vigo, 10
Ancona, 5 bxs.
Babia, 5
Beyrout, 20
Bilbao, 119
Boston, 900
Carthagena, 50 30
Ceara, 60 kgs.
Galatz, 732 pks.
Genoa, 130
Ghent, 4
Hamburg, 5
Havana, 30
Hiogo, 20
Ibrail, 107
La Guayra, 21
London, Ont., 14 bxs.
Madrid, 5
Malmo, 6
Marseilles, 15
Melbourne, 36
Montreal, 10
Naples, 40
New Orleans, 50
New York, 70 pks. 598
Oporto, 8
Puerto Cabello, 20
Rotterdam, 2
San Francisco, 86
Santander, 6
Seville, 100 kgs.
Stettin, 18 10
Venice, 18
Citric Acid—
Malaga, 2 c. £14
Copperas—
Mitylene, 3 t. 16 c. 2 q. £10
Piræus, 4 15 3 10
Quebec, 3 8 7
Smyrna, 13 3 30
Bombay, 17 6 1 38
Constantinople, 1 9 2 5
Kurachi, 3 11 1 9
Galatz, 3 5 2 7
Copenhagen, 6 2 12
Alexandria, 1 17 5
Caustic Potash—
E. London, 2 c. 2 q. £7
New York, 3 t. 11 65
Chicago, 12 7 282
Copper Sulphate—
Bilbao, 29 t. 19 c. 3 q. £515
Bordeaux, 10 2 182
B. Ayres, 1 3 20
Genoa, 85 13 1 469
Leghorn, 1 3 20
Nantes, 17 2 300
Leghorn, 5 100
Antwerp, 4 19 1 100
Barcelona, 2 1 3 37
Beyrout, 7 6
Bilbao, 14 17 267
Bordeaux, 13 4 1 261
Porto Rico, 2 10 3 50
Rotterdam, 1 8 3 24
Smyrna, 10 1 9
Venice, 9 185
Catania, 2 14 49
Constantinople, 10 11
Hamburg, 5 92
Mazatlan, 63 8 1,127
Melbourne, 10 186
Konigsberg, 2 9 3 47
Leghorn, 12 9 2 225
Venice, 11 13 223
Rotterdam, 7 13 137
Antwerp, 10 2 9
Bordeaux, 2 10 46
Venice, 9 18 180
Bordeaux, 2 38
Genoa, 5 1 3 95
Christiania, 10 7 3 158
Carbolic Acid—
Hamburg, 4 t. £243
New York, 3 225
Philadelphia, 10 c. 83
Rio de Janeiro, 2 8 68
Hamburg, 2 6 3 q. 40
Marseilles, 17 3 1 122

Chemicals *(otherwise undescribed)*
Colon, 1 cs. £5
Epsom Salts—
Bombay, 200 kgs.
Santos, 20 brls.
Alexandria, 100
Bombay, 100
Seville, 9 cks.
Gypsum—
Calcutta, 5 t. £20
New York, 17 8 c. 51
Iron Nitrate—
Montreal, 5 t, 6 c. 2 q. £17
Iron Oxide—
Rosario, 15 t. £44
New York, 1 7 c. 22
Lead Nitrate—
Montreal, 1 t. 1 c. 1 q. £23
Manure—
Ghent, 39 t. 11 c. 1 q. £194
Havre, 100 5 487
Valencia, 50 160
Gr. Canary, 25 70
Magnesium Chloride—
Montreal, 18 t. 7 c. £48
Oxalic Acid—
New York, 14 t. 10 c. 2 q. £470
Barcelona, 13 3 45
" 5 t. 160
Phosphorus—
Santander, 4 c. 1 q. £33
Potassium Carbonate—
Boston, 8 t. 6 c. £117
New York, 18 9 246
Potassium Bichromate—
Odessa, 2 t. 2 c. £65
Dunedin, 4 3 10
Phosphate—
Hamburg, 49 t. 11 c. 2 q. £319
Potassium Chlorate
Havana, 10 c. £22
Yokohama, 10 t. 477
Boston, 5 233
New York, 10 466
" 5 233
Genoa, 2 10 108
Hamburg, 5 5 256
Hiogo, 10 466
Ferrol, 6 14
Philadelphia, 3 12 168
B. Ayres, 8 373
St. Petersburg, 10 490
Stettin, 2 10 123
Copenhagen, 1 42
Randers, 8 373
Salt—
Adelaide, 12½ t.
Algoa Bay, 9
Antwerp, 206½
Baltimore, 100
Boston, 100
Brisbane, 200
Calcutta, 3,318
Callao, 5
Cameroons, 50
Cape Coast, 39
Conakry, 20
E. London, 37
Halifax, 20
Mauritius, 170
Melbourne, 25
Montreal, 712
New York, 80
Para, 17
Philadelphia, 65
Salt Pond, 13
Santos, 4
St. Johns, 5
Stockholm, 71
Thorshaver, 151
Valparaiso, 91
Adelaide, 90
Antwerp, 187
Banna, 50
Benin, 11
Black Point, 75
Calcutta, 638
Ghent, 250
Iceland, 135
Landana, 11
Loango, 10
Melbourne, 211¼
Para, 300
Santos, 2½
Sinoe, 10
Transvaag, 165
Valparaiso, 1 1 c.
Soda Ash—
Alicante, 10 brls.
Baltimore, 327 tcs. 765 cks.
Boston, 2,050 bgs. 160 647
B. Ayres, 150 brls. 100
Colombo, 8

Soda Ash—*continued.*
Kobe, 128 brls.
La Guayra, 6 cks.
Montreal, 471 76
New York, 270
Philadelphia, 704 413
Puerto Cabello, 6
Rosario, 50
Santos, 30
New York, 70
Adelaide, 60
Baltimore, 219
Barcelona, 85
Bilbao, 28
Galatz, 20
Genoa, 17
Havana, 5
Leghorn, 42
Madrid, 87
Montreal, 80
New Orleans, 19
New York, 82
" 195
Odessa, 5
Piræus, 80
Santander, 21
Smyrna, 75
Soap—
Antwerp, 520 cs.
Barbadoes, 100 bxs.
Cape Town, 80
Curacao, 109
Hamburg, 200
Kurrachee, 10
Malta, 100
New York, 3 dms.
St. Johns, 4
Teneriffe, 550
Toronto, 100
Valparaiso, 5
Naples, 6
Accra, 112
Addah, 1
Alexandria, 95 2 brls.
Algoa Bay, 590
Batavia, 3
Belize, 667
Bombay, 1,257 100 kgs.
" 11 cks.
Cameroons, 140
Ghent, 40
Gibraltar, 250
Goree, 6
Hiogo, 5
Hong Kong, 22
Kurrachee, 7 cs. 500
Lagos, 35
Las Palmas, 292
Malta, 30
" 90
Messina, 3 pks.
Monrovia, 200
New York, 1 ck.
Para, 1 100
Piræus, 43 pks.
St. John, 15
Shanghai, 200
Singapore, 13
Valencia, 10
Victoria, 70
Winnebah, 100
Zanzibar, 250 bdls.
Soda Crystals—
Bombay, 40 kgs.
Boston, 560 brls.
Calcutta, 30
Copenhagen, 10 cks.
Montreal, 478
New York, 280
Philadelphia, 280
Smyrna, 50
Truro, 3 t.
Boston, 500
New Orleans, 67
Seville, 12
Sodium Bicarbonate—
Amsterdam, 10 kgs.
Bombay, 14 cks.
Bordeaux, 100
Brisbane, 50
Calcutta, 800
Catania, 60 6
Constantinople, 20
Copenhagen, 62
Danzic, 55
Gothenburg, 10
Halifax, 100
Hamburg, 195
Havre, 125
Ibrail, 20
Malmo, 10
Mexico City, 50
Montreal, 1,002 130
Rotterdam, 40 2
St. Johns, 5
Truro, 5 t.
B. Ayres, 30 33

Sodium Silicate—
Carthagena, 22 brls.
Constantinople, 10 17 cks.
Halifax, 17
Malta, 20
Montreal, 119
Port Louis, 7
Rotterdam, 10
Santander, 5
Seville, 170
Smyrna, 22
Volo, 10
New York, 18
Pasages, 4

Sodium Sulphate—
Quebec, 2 t. 18 c. £21
Montreal, 3 14 6

Saltcake—
Baltimore, 59 t. 4 c. £141

Superphosphate—
New Orleans, 1,602 t. 4 c. 1 q. £4,085

Sheep Dip—
Cape Town, 5 t. 6 c. 3 q. £206
Monte Video, 125 cs. 200
B. Ayres, 51 drs. 122
Algoa Bay, 1 t. 42
B. Ayres, 29 16 c. 2 q. 613
Cape Town, 46 drs. 17
Galveston, 10 t. 200

Sodium Bichromate—
Lisbon, 1 t. 12 c. 1 q. £47

Sodium Chlorate—
Hamburg, 1 t. £55
New York, 4 246

Spar—
Hamburg, 19 t. 15 c. £375

Sulphur—
Boston, 81 t. 11 c. £376
Montreal, 17 19 3 q. 85
New York, 50 225
Para, 1 8 9
Santos, 9 6 2 60
Rio de Janeiro, 1 11 3 11
Halifax, 30 127
Pernambuco, 2 5 2 15
Boston, 50 2 225
Santos, 9 6 2 60
Boston, 25 1 113

Saltpetre—
Almeria, 3 c. 3 q. £5
Santos, 2 4 2 50
Pimental, 8 9
Havana, 10 11
Santos, 2 2 49
Porto Alegre, 10 13

Sodium Nitrate—
Almeria, 1 t. 6 c. £11
Barcelona, 5 25
New York, 2 5 2 q. 55
Las Palmas, 12 17 2 120
Oporto, 1 3 10

Sodium Biborate—
Hamburg, 16 t. 6 c. 3 q. £490
New York, 7 19

Salammoniac—
Barcelona, 5 c. £9
,, 6 t. 209
Philadelphia, 2 11 2 q. 90
Trieste, 10 3 19
Alexandria, 1 34
Amsterdam, 5 9
Ibrail, 9 14
Galatz, 7 16

Tar—
Cette, 857 t.
Loanda, 20 brls.

Tartaric Acid—
Pimental, 1 c. £5
Monte Video, 1 t. 6 2 q. 173
Montreal, 10 47

Tartar—
New York, 15 t. £1,425

Tin Crystals—
Trinidad, 1 t. 12 c. 2 q. £110

Zinc Oxide—
New York, 5 t. 4 c. £120

Zinc Chlorate—
Bombay, 4 t. 14 c. 1 q. £64

HULL.

Week ending Oct. 28th.

Alkali—
Bari, 20 cks.
Drontheim, 94
Riga, 40
Trieste, 57

Bone Size—
Amsterdam, 10 cks.
Harlingen, 10
Rotterdam, 7

Bleaching Powder—
Bergen, 16 cks.
Hamburg, 28

Borax—
Danzig, 5 cks.
Wasa, 1

Caustic Soda—
Abo, 53 drms.
Danzig, 132
Dunkirk, 9
Riga, 454
Trieste, 17
Venice, 50
Helsingfors, 100 40 kgs.

Chemicals *(otherwise undescribed)*
Antwerp, 1 ck.
Abo, 38 1 pkg.
Bordeaux, 40 cs.
Bremen, 1 2
Copenhagen, 25 12 2
Christiania, 8
Danzig, 10
Dunkirk, 20
Fiume, 100
Gothenburg, 15 7
Hamburg, 64 34 148
Helsingfors, 2
Hango, 10
Konigsberg, 10 9
Lisbon, 12 12
Melbourne, 380 1
Palermo, 2
Rouen, 30
Rotterdam, 3 120 32
Riga, 79 125
Stockholm, 1
St. Petersburg, 110
Stettin, 110 2
Trieste, 19
Wasa, 14

Dyestuffs *(otherwise undescribed)*
Bergen, 20 bgs.
Danzig, 10 cks.
Dunkirk, 1
Gothenburg, 1 cs. 101 bgs.
Hamburg, 3 drms.
Rouen, 5
Rotterdam, 2 2
Stettin, 3 90
Christiania, 47 c.

Manure—
Dunkirk, 350 bgs.
Hamburg, 993
Rotterdam, 294

Pitch—
Abo, 20 t.
Ancona, 367

Soda Ash—
Ancona, 4 cks.

Soap—
Bergen, 40 cs.

Tar—
Amsterdam, 5 cks.
Abo, 200
Helsingfors, 100

GOOLE.

Week ending Oct. 16th.

Alkali—
Dunkirk, 30 drms.

Bleaching Preparations—
Rotterdam, 36 cks.

Coal Products—
Ghent, 2 cs.
Rotterdam, 68 cks.

Chemicals *(otherwise undescribed)*
Ghent, 21 cks.
Hamburg, 25
Rotterdam, 4

Dyestuffs *(otherwise undescribed)*
Boulogne, 2 cs. 15 cks. 5 drms.
Ghent, 2
Hamburg, 112
Ghent, 126
,, 41

Manure—
Boulogne, 48 bgs.
Rotterdam, 291

Pitch—
Antwerp, 82 t.

GRIMSBY.

Week ending Oct. 20th.

Chemicals *(otherwise undescribed)*
Dieppe, 24 cs. 1 ck.
Hamburg, 2
Rotterdam, 25

GLASGOW.

Week ending October 30th.

Ammonium Sulphate—
Demerara, £3,980
Bordeaux, 10 t. 1½ c. 121

Chloroform—
Sydney, £23

Caustic Soda—
Maraku Bahia, 10 t. 11 c. £118

Cream of Tartar—
Sydney, 11 c. £70

Dyestuffs—
Extracts
Oporto, 19¾ c. £32

Epsom Salts—
Christiania, 100 bgs. £35
Sydney, 39

Manure—
Barbadoes, 71 t. 1 c £630
,, 10 90
Demerara, 20 180

Phosphate—
Demerara, 43 t. £150

Potassium Bichromate—
Antwerp, 105½ c. £158
Bordeaux, 199½ 326
Antwerp, 302½ 915
Rotterdam, 37 cks. 305
Calcutta, 10½ 17
Rotterdam, 3 22

Potassium Prussiate—
New York, £286
,, 3 t. 10 c. 311

Potassium Chloride—
Bilbao, £50

Paraffin Wax—
Bordeaux, 2 t. 11¼ c. £67
Bilbao, 1 35

Sulphuric Acid—
Bombay, 9 t. 2 c. £193
Rangoon, 5 19½ £39. 15s.

Superphosphates—
Demerara, 16 t. 6 c. £51

Soap—
New York, 38 c. £33

TYNE.

Week ending October 29th.

Ammonium Sulphate—
Rotterdam, 10 t.

Anthracene—
Rotterdam, 9 c.

Ammonium Carbonate—
Barcelona, 10 c.
,, 11

Antimony—
Hamburg, 3 t.
Copenhagen, 6 c.

Alum—
Barcelona, 11 t. 3 c.

Arsenic—
Venice, 9 t. 19 c.
Barcelona, 22 1
,, 10

Alkali—
Leghorn, 6 t. 12 c.
Antwerp, 5 7
Hamburg, 10 17
Christiania, 10 11
Odense, 12 8
New York, 50 2
Rotterdam, 3 16
,, 8 10

Bleaching Powder—
Antwerp, 60 t. 2 c.
Hamburg, 40 11
Gothenburg, 40 4
,, 5 3
Ghent, 35 19
Odessa, 3 2
Esbjerg, 14
Gothenburg, 9
St. Petersburg, 76 t.
New York, 134 6
Pasages, 33 5
Riga, 6 3
San Francisco, 53 t. 18 c.
Copenhagen, 7
,, 5 8
Stockholm, 2 16
Gefle, 4 19
Rotterdam, 4 6
,, 15 5
,, 7 1
,, 11 18
Libau, 49 14

Barytes Carbonate—
St. Petersburg, 2 t. 10 c.
Hamburg, 104 15

Barytes Nitrate—
Antwerp, 15 c.

Barytes—
San Francisco, 10 t.

Calcined Magnesia—
Genoa, 7 c.
Odessa, 3

Caustic Soda—
Genoa, 14 t. 10 c.
Naples, 1 3
Gothenburg, 10 6
Odessa, 21 15
Antwerp, 2
Valencia, 10 10
New York, 299 3
Riga, 24 19
San Francisco, 108
Barcelona, 3 15
,, 20
,, 45
Stockholm, 1 9
,, 34 10
Gefle, 1 8
Rotterdam, 1 9

Epsom Salts—
Odessa, 2 t. 3 c.

Gypsum—
New York, 96 t. 14 c.

Litharge—
Gothenburg, 10 c.
Riga, 1 t. 6
Stockholm, 3
,, 2 12
Rotterdam, 11
,, 12

Magnesia—
Hamburg, 5 c.

Naphthaline—
Riga, 26 t. 6 c.

Potassium Chlorate—
St. Petersburg, 5 t.
Antwerp, 1 1 c.
Odessa, 1
Riga, 13
Copenhagen, 5 18
Rotterdam, 5
,, 1

Phosphorus—
Barcelona, 8 c.

Sodium—
Hamburg, 1 cs.

Soda—
Landskrona, 5 t. 7 c.
Esbjerg, 6
Svendborg, 10 3
Horsens, 1 2
,, 2 6
,, 36 4
Vielle, 23 4
Odense, 11 17
St. Petersburg, 27
Genoa, 32 4
Naples, 7 13
Copenhagen, 30 2
Stockholm, 9 10
,, 21 11
Gefle, 44 7
Rotterdam, 5 3

Sodium Hydrosulphate—
Leghorn, 1 t. 1 c.

Soda Ash—
Odessa, 20 t. 12 c.
New York, 45 8
Libau, 15 2
Lisbon, 19 19
Gothenburg, 32 11
Venice, 10
Odense, 43 17

Sulphur—
St. Petersburg, 2 c.
Stockholm, 90 t.
Gefle, 70

Salammoniac—
St. Petersburg, 16 t. 19 c.

Sodium Suphate—
New York, 101 t. 17 c.

Tar—
Odessa, 47 t. 7 c.

PRICES CURRENT.

WEDNESDAY, NOVEMBER 5, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,		55/-	
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅜
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. ,,	1	12	6
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880 = 28° .. .. per lb.	0	0	3
,, = 24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	11	11	3
,, ,, (grey), Hull .. .. ,,	11	6	3
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	7	6
,, Carbonate (native) .. .. ,,	3	12	6
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	5	15	0
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	7½
,, 50/90 ,, ... ,,	0	3	7
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6¼
,, (crude 60°) .. .. per gallon	0	1	7
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	7
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	15	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	10
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	58	0	0
,, Sulphate .. .. ,,	18	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	10	0
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	10	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	15	0
,, ,, (grey) .. .. per ton	13	0	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	7½
Oils:—			
Cotton-seed .. .. per ton	19	5	0
Linseed .. .. ,,	23	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5½
,, American .. .. ,,	0	0	5⅜
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	3	5	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	0½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	0	0
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	7	6
,, ,, (Soda Crystals) .. .. ,,	3	2	6
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, ... ,,	12	12	6
,, ,, (70 % Caustic Soda) ,, ... ,,	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	6	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	31	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	1	17	6
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	5	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	99	0	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	25	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

THE

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Notices.

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TO ADVERTISERS.

SPECIAL NEW YEAR'S NUMBER OF THE "CHEMICAL TRADE JOURNAL."

In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers.

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

On the occasion of the New Year's Special Number, we shall make use of the whole of the lists we have referred to, numbering altogether, as we have stated not less than 10,000 names.

Of course, for this special issue. there will be special prices for advertisements, but those who order a series, either commencing with that number or previously, will have the advantage of our regular tariff rates, of bringing their specialities under the notice of a very large circle of buyers.

As only a limited number of pages will be added for advertisements, early application for space is necessary. We shall be pleased to send tariff of charges to all those who may desire to advertise in this Special Number.

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Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates:—

30 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

THE SALE OF POISONS.

STRAWS show which way the wind blows, and there are not wanting indications that the Medical and Pharmaceutical Associations are moving in the direction of increased restrictions on the sale of poisons. The humane object they have in view is above criticism. We are at one with them in an earnest desire to diminish the risks of crime, of suffering, and of death from the unrestricted supply of poisons. There are, however, considerations which strike us as important, which do not appear to have been noticed by our contemporaries. The sale of poisons and the distribution of poisons are not necessarily synonymous expressions.

In our issue of September 6th last, we commented on the evidence adduced in connection with the Ardwick Poisoning Case, which went to prove that there were other and more dangerous risks of distributing poisons than those arising from the *sale* by persons "qualified" (!) under the Pharmacy Act. Few people would regard arsenic as a harmless, innnocuous substance, yet it was proved that the casks which had contained this substance were allowed to lie about, with considerable quantities of white arsenic adhering to them, much as if they had only contained plaster of Paris. We have in our recollection a glassworks where, in about a week, as much arsenic was used as would have sufficed to fatally poison the whole population of London. Yet this substance was not the subject of any special vigilance on the part of the proprietors, it being certainly very easy for anyone to have taken a handful of arsenic at a time. If it be assumed that three grains is a fatal dose, it is easy to see what a serious matter is this unrestricted possession of poisons. The stuff lay about in open kegs, and the kegs when emptied lay about also. Little need we have wondered if death by poison had been the principal factor in the Registrar's returns. We have referred to this to show that if increased legislative control is needed in relation to the sale of poisons, increased legislative control is needed to reach the users of poisons in quantity, and prevent their reckless exposure to risks of distribution. We are not advocates of too much legislation, but in this case, legislation having been thrust upon us, it behoves us to see that it is at least effective and complete. We commend this view of the subject to the agitators for reform.

There is another standpoint from which we may view the question. That of qualification.

The Pharmacy Act provides:—

(*a*) That only persons possessing the qualification specified in the Act shall be allowed to sell or keep open shop for retailing, dispensing, or compounding scheduled "poisons," or to assume the title of chemist and druggist or equivalent title.

(*b*) That the qualification shall be having been in business as a chemist and druggist before the passing of the Act, or having passed certain examinations conducted by the Pharmaceutical Society.

(*c*) That the evidence of qualification shall be registration.

In our editorial capacity we hear ever and anon the grievances and complaints of chemists of various denomina-

tions, and among them, with sufficient frequency to call for some notice on our part, we have had the complaint that an analytical, as distinguished from a pharmaceutical, chemist, even though he be a Fellow of the Institute of Chemistry, is by law prohibited from selling or compounding a poison. We certainly agree with them that Fellowship of the Institute of Chemistry is as good a guarantee of their knowledge of chemicals and competence as distributors of poisons, as the present legal qualification of pharmacists is or can be. Without desiring in any way that the consulting or analytical chemist should degenerate into a mere seller of nostrums, we do say that to prohibit him from selling poisons if he finds it necessary to do so, is wanting both in justice and common sense. This will especially be seen by referring to the further provisions of the Pharmacy Act, viz.:

> (*d*) That the foregoing provisions shall not extend to or interfere with the business of any legally qualified apothecary, or of any member of the College of Veterinary Surgeons, or with the making or dealing in patent medicines, or with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing.

Surely the scientifically educated body of chemists who are on the Register of the Institute of Chemistry are as fit to have the disposal of poisons as any person or body of persons within the four seas of Britain, be they qualified apothecaries (Shakespearian or otherwise), veterinary surgeons, *patent medicine vendors, or wholesale dealers.* We have italicised the latter, because it is an important point of attrition. In the first portion of our remarks, we have shown that it is in wholesale dealing with poisons that a great element of danger lies. The cases cited show the absurdity of leaving wholesale dealers entirely outside the pale of the Act; and on the ground that a Fellow of the Institute of Chemistry is as competent to deal with poisons as a member of the Royal College of Surgeons, or of the Pharmaceutical Society, we are decidedly of opinion that the Fellows of the Institute of Chemistry should be placed on an equally favourable footing with pharmacists in any pending legislation. Their special opportunities of seeing how poisons are dispersed would of itself be of great national service.

CHEMICAL ENGINEERING.*

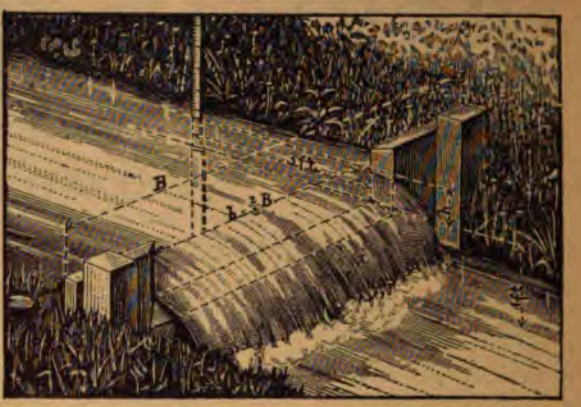
XXIX.

WEIGHING AND MEASURING.

WE have already seen that the *theoretical* discharge of water from an orifice is found by multiplying the area of the orifice, in feet, by the velocity of the effluent water, measured in feet per second. If the orifice, instead of opening freely into the air, opens into another reservoir of fluid, such as a sluice valve placed at the bottom of a division separating two tanks, the difference of level between the two reservoirs must be taken as the effective head. (H in the foregoing formula.)

It is often required to note with a fair degree of accuracy the quantity of water flowing down a given stream or channel. This may be done by placing a board—such as is shown in the accompanying illustration—across the stream, at a point where the water flows very slowly.

*A course of lectures delivered by Mr. George E. Davis, at the Manchester Technical School. *All rights reserved.*



A notch is cut in the board, sufficient in depth to pass all the water to be measured, and not more than two-thirds of the width of the stream in length. The edges of the notch on the bottom and sides must be bevelled to a feather-edge facing down-stream, and the surface of the water below should not be less than one foot. The illustration shows very clearly how the notch-board should be arranged; about three feet behind the notch-board, or sill, as it is sometimes called, a stake should be driven into the bed of the water-course or channel, the top of the stake being level with the knife edge of the sill. When the water at the stake has reached its greatest depth, measure the depth of water over it with a thin-edged rule, which will give the necessary data for our calculations. The following table will show the quantity of water in cubic feet per minute, for each *inch* in length of the sill, for various depths of water (H) over the stake.

Inches.	Parts of an Inch.			
		¼	½	¾
1	·40	·55	·74	·93
2	1·14	1·36	1·59	1·83
3	2·09	2·36	2·63	2·92
4	3·22	3·52	3·83	4·16
5	4·50	4·84	5·18	5·54
6	5·90	6·28	6·65	7·05
7	7·44	7·84	8·25	8·66
8	9·10	9·52	9·96	10·40
9	10·86	11·31	11·77	12·23
10	12·71	13·19	13·67	14·16
11	14·67	15·18	15·67	16·20
12	16·73	17·26	17·78	18·32
13	18·87	19·42	19·97	20·52
14	21·09	21·65	22·22	22·79
15	23·38	23·97	24·56	25·16
16	25·76	26·36	29·97	27·58
17	28·20	28·82	29·45	30·08
18	30·70	31·34	31·98	32·63
19	33·29	33·94	34·60	35·27
20	35·94	36·60	37·28	37·96
21	38·65	39·34	40·04	40·73
22	41·43	42·13	42·84	43·56
23	44·28	45·00	45·71	46·43
24	47·18	47·91	48·65	49·39

The general formula for arriving at the same result is:—

$$G = d \times \sqrt{d} \times l \times 2.67$$

$$l = \frac{G}{d \times \sqrt{d} \times 2.67}$$

$$d = \left(\sqrt[3]{\frac{G}{l \times 2.67}}\right)^2$$

Where G = Gallons discharged per minute.
d = Depth of overflow in inches.
l = Length of weir in inches.

In building channels for the flow of large quantities of liquids, and even for small volumes, it should always be remembered that the frictional resistance varies directly as the wetted perimeter and inversely as the area of the section, so that when the area is constant, the friction will vary as the wetted perimeter. This shows that the best form of section is one with the smallest perimeter for a given area—a square section, when the upper water lime is in free air.

Sometimes the sill or notch-board cannot be employed for sundry local reasons. In this case, a length of the stream should be chosen—say one hundred feet—and the average area of the section found by multiplying the width by the average depth. A stake should be fixed at each end of the measured length, and a float consisting of a bottle, cork, or piece of wood, thrown into the middle of the stream a little above the first stake, and the time noted which is occupied in passing from one stake to the other. This trial should be repeated several times and the average taken, as the method can only be approximate. From the quantity thus found, one fourth should be deducted to allow for friction of the bed and sides.

The foregoing formulæ must not, of course, be used without due intelligence or knowledge. The velocity of approach to the weir must not be neglected, as the formulæ are for still water, and require modification when there is sensible velocity. The thickness of the crest of the weir must also be taken into account, a thick wall will only allow about 71 per cent. of the volume to pass under a given head, as when a thin knife edge is used, while if a two-inch plank be employed, about 85 per cent. will flow under similar conditions.

Narrow weirs inserted in a stream require a further correction, but these are refinements I can hardly enter into in this course of lectures.

It is often required to be known what size of a pipe (say two or three diameters long) would be necessary to conduct away a given flow of water, such as the waste water from condensing tanks and the like; it is often useful in gauging small flows, if care be taken to select a size which will *just* run full. The following table gives approximate numbers :—

Diameter of pipe in inches.	Gallons per minute.	Diameter of pipe in inches.	Gallons per minute.
1	3·2	4	112·0
1½	8·8	5	179·0
2	18·1	6	283·0
3	50·0	7	415·0

An overflow pipe inserted into the side, and near the top of a tank, so that it is only just covered, will pass the quantity of water indicated by the following formula, when :—

G = Gallons per minute, and

d = diameter of overflow in inches.

$$G = d^{2\cdot5} \times 3\cdot2$$

A vertical overflow pipe running through a tank should be made with a trumpet-shaped mouth, which may be considered as a circular weir, but the following formula will enable an estimate of its capacity to be made more easily:—

D = Depth of water over trumpet, in inches.

G = Gallons per minute.

d = Diameter of trumpet mouth.

then $$G = D \times \sqrt{D} \times d \times 8\cdot4.$$

$$D = \left(\sqrt[3]{\frac{G}{d \times 8\cdot4}}\right)^3$$

$$d = \frac{G}{D \times \sqrt{D} \times 8\cdot4}$$

These formulæ have many important bearings on chemical engineering, their use in actual practice will be more fully explained in the last lecture, when they can be worked in, to show how new plant should be constructed; in the meantime, the student should endeavour to work out problems for himself, based on these rules, as he will find it good exercise.

So far, I have only dealt with what may be called the regular flow of liquids. Where the flow is irregular, or intermittent, and the total volume passed in a given time is required to be known, the solution of the problem is often one of great difficulty. If the liquid is one in which a meter can be employed, the difficulty disappears, but the use of a meter is not often possible. Even meters deserve some attention in proper selection, as some patterns will not not register a *small* continuous flow. When a meter cannot be employed, two other courses remain open: the first, to collect and measure the volume in tanks or reservoirs, over a given period, which of course can be very accurately performed. The second method is to measure by means of tumbling boxes of known capacity, to which automatic counters are attached, to register the number of falls the box or bucket has made. With properly constructed buckets, the measurements are much more accurate than many believe, and I have seen them employed in several factories.

Our attention may now be turned to the measurement of gaseous volumes, especially when in a state of motion.

(To be continued.)

SOCIETY OF CHEMICAL INDUSTRY.

LONDON SECTION.

THE first meeting of the session was held on Monday, November 3rd, at Burlington House, the newly elected chairman of the Section, Mr. Thos. Tyrer, presiding. After a few words from the chairman, pledging himself to an earnest effort to execute the duties of his office to the best of his ability, and in particular, to endeavour to cause the meetings to begin punctually at the time appointed, Mr. A. G. Green read a paper on the "Diazotype Process of Photographic Printing and Dyeing," by himself and Messrs. Cross and Bevan. The reader's researches about three years ago led to the discovery of a new class of dyestuffs which dyed cotton direct without a mordant, and the group of bodies thus obtained had been called the "primuline series." Further investigation had shown that when a member of this series is diazotised on the fibre and exposed to light, it receives a photographic impression capable of development by a suitable phenol or amine; the resulting colour depending on the nature of the latter; thus *a*-naphthol sulphonic acid would give a crimson print, *B*-napthol sulphonic acid a maroon, resorcin an orange, and *X*-naphthylamine a purple. The use of the process could be extended to films of gelatine, on glass or xylonite, and its applicability was extremely wide as a means of decoration, particularly having regard to the case with which different parts of a design could be developed with different reagents thereby acquiring different colours, it was remarkably successful, half tones of great delicacy being readily obtained. With respect to the mechanism of the change brought about by light, it was difficult to offer an exhaustive explanation; direct experimental evidence had been obtained by observation of the fact that, the action was accompanied by the evolution of nitrogen, which led to the belief that the diazo group was split off, but at present, little additional knowledge had been gained. It appeared that the diazotised primuline was more sensitive than the silver salts generally used in photographic printing, and was affected by a greater number of the rays of the spectrum, the maximum effect being produced by the green.

In the discussion which followed, the chairman particularly adverted to the use of the process for the reduplication of engineers' drawings, and considered it might prove better than those now in vogue. Dr. Bourcart touched on the possibility of a considerable amount of fading taking place, instancing eosin as similarly unstable. Dr. Alder Wright pointed out the improbability of English sunlight being strong enough for printing quickly on a commercial scale, and drew attention to the explosive properties of some diazo bodies. Mr. Spiller referred

to the fact that by the use of a suitable developer engineers' drawings could still be produced in the familiar blue lines, although the ferro-prussiate process might be discarded. Mr. Bolas expressed fears for the permanence of prints obtained by this method, he having found perceptible fading occur after exposure to bright sunlight for two days. Mr. Rosenthal remarked, with regard to what Dr. Wright had said about explosives, that certain were known which exploded on exposure to light, but it was not generally expedient to make the knowledge of them public property. Mr. Allen asked if the diazotised primuline after the change consequent on exposure was sufficiently soluble to permit of its removal from the fibre and subsequent analysis. Mr. Friese Green mentioned that by diazotising with *silver* nitrite greater sensitiveness resulted, and thought the process would be much improved could a white background be obtained instead of the natural yellow colour of the primuline. Mr. A. G. Green, replying for himself and his colleagues, said that the prints, particularly on gelatine films, were fairly stable, and thought no fear of explosion need be entertained. Printing would be done by the electric light, thus rendering the process independent of sunshine. The substance being quite insoluble after the reaction, Mr. Allen's suggestion of its removal for analysis could not be carried out; in the case of silk, a certain limited success had attended their efforts to get a white background.

The next paper on the agenda was one by Mr. Franklin Clarke (U.S.A.), on "The Permanence of Creosoting Agents," a precis of which, in the absence of the author, was given by Mr. Watson Smith. According to American practice coniferous woods were used for destructive distillation contrary to the ideas prevalent in this country where hard woods were preferred. As a consequence, the products obtained differed in several respects. The lighter creosote oils were remarkable for containing noteworthy quantities of terpens, and the constituents of the oils used for the impregnation of timber were on the whole less volatile than corresponding substances in the material generally used, viz., coal-tar creosote. Wood exposed to the decaying action of sea water or the destructive effect of sea worms, like the teredo, was preserved more by treatment with wood creosote than by any of the methods usually employed, not excluding the use of various metallic salts, of which mercuric chloride might be taken as a type. Besides the main question of wood preservation the various products of the destructive distillation of woods of the *coniferae* were worthy of attention. As Mr. Tyrer pointed out in the subsequent discussion (which, in the absence of the author, was more of the character of a commentary than a criticism) methyl alcohol was of immense importance in the art, and the excellent sample shown proved that should excise difficulties be removed, it could be after only slight purfication employed freely for many purposes. It had been pointed out that the toxic effect of alcohols of the ethylic series increased with their molecular weight, and that the effects of methyl alcohol were less deleterious than those of the next member. At present the methyl alcohol there shown could scarcely be called potable, but even if it never came into use for drinking it might serve the purposes of the perfumer and maker of tinctures. The next meeting of the section will be on Monday, December 1st.

LIVERPOOL SECTION.

THE opening meeting of the Liverpool section for the present session was held at University College on Wednesday, when the chairman, Mr. A. Norman Tate, delivered an address on "Some aids to the future development of Chemical Industry." Mr. Tate referred to the Technical Instruction Act and to the technical education to be given in elementary schools, continuation classes, and colleges, and pointed out the necessity of such instruction being of a practical character if it is really to serve as an aid to the future development of chemical industry. In regard to the teaching of technological chemistry, he considered it essential that something more than mere lectures, aided by diagrams and specimens to illustrate the special manufacture dealt with, was wanted, and suggested the value to be derived from a course of lectures dealing with the main principles of chemical technology, without reference to any one special industry. Further, he pointed out the necessity of offering more inducement than was the case at present, if the services of first-rate teachers of technological subjects were to be secured at our colleges and universities. Mr. Tate then referred to the aid to be derived in the chemical industries by the establishment of technical, trade, or commercial museums, and described such institutions he had visited at Brussels, Antwerp, and Haarlem. In an important port like Liverpool the founding of such a museum could not fail to give a great impetus to commerce and industry and to stimulating scientific inquiry, whilst if a research laboratory were connected therewith, a large number of substances which came into the hands of brokers and merchants would be carefully examined, and would not be relegated to the category of useless articles as they are to-day. In conclusion, the speaker dwelt upon the lack of good handbooks on technological subjects, and pointed out directions in which members of the society might help chemical industry by reading papers before the section on analytical processes of a controversial nature, and thus, by comparing their own results with that of others, be able to solve the cause of the differences that arise in the hands of various workers of one and the same process. He also referred to the vexed question of sampling. Mr. Tate was accorded a cordial vote of thanks for his valuable address, on the motion of Dr. F. Hurter, seconded by Mr. E. K. Muspratt, and supported by Professor Campbell Brown.

MANCHESTER SECTION.

THE first meeting of the Manchester Section of the Society of Chemical Industry was held on Friday at the rooms of the Manchester Chemical Club, Victoria Hotel. Mr. Ivan Levinstein presided, and there was a good attendance of members. The chairman introduced the subject of the amendments to the Patent Laws suggested by the Chemical Committee of the Chamber of Commerce. He said certain provisions of the Patent Act of 1883 were mischievous and even inpracticable when applied to chemical patents, and that some provision should be made for distinguishing between chemical and mechanical patents. The Chemical Committee proposed that the patentee should specify, by name or description, each substance he proposed to use, and deposit samples sufficient for analysis or examination of the results, and of all raw and intermediate products used, and in case of patents relating to coal-tar colours, should accompany the specifications, &c.; with dyed specimens of cotton, wool, or silk, showing the results obtained, and a statement of the method employed in dyeing. In relation to this matter Sir Henry Roscoe, M.P., had written to him:—

"The subject is one in which I feel much interest, and your report has my hearty sympathy. I quite agree as to the necessity of some change in the law of chemical patents. As you point out, section 18 opens the door to abuses of a serious character, and the proposals of your Committee seem to me to meet the difficulty, inasmuch as they do not act as a restriction of the honest inventors, but only prevent patentees from abusing their privileges."

He believed if our patent laws were placed on a proper footing, and the present move for higher technical education were continued, the chemical industry in England would develop faster than ever.

On the motion of the Chairman, seconded by Mr. Grimshaw, a resolution approving of the proposals of the Committee was adopted.—Mr. Peter Hart read a paper on "Undeveloped Industries," referring to the utilisation of shale, and the manufacture of potato starch.—Mr. J. Carter Bell (county analyst) read a paper on "River pollution, and purification of sewage by electricity and other methods." Referring to the condition of the Irwell, he said a sample at Irwell Springs, though taken at an unfavourable time of the year, only contained suspended matter in the proportion of 8 per 100,000 parts, and, after passing the first works, the water contained 37 parts of solids, and 7 of suspended matter. A sample taken on a Sunday in the borough of Salford, contained to his surprise as much as 106 parts solids, a result that might be due to manufacturers having a general "clean up" on Saturday. The papermakers were responsible for a great deal of pollution, the liquid consisting of the resinous matter from the straw and esparto used, the plant necessary for the utilisation of which was very expensive. Bleachers, dyers, india-rubber manufacturers and others, were also concerned in the pollution of the river, and the bleaching powder and caustic dregs turned into the Irwell and Roach must amount to 150 to 200 tons per week, the whole of which might be kept out. Samples taken from drains discharging into the river from works, showed respectively the following proportion of solid parts per 100,000: 456, 246, 154, 282, 135, 159, 477, 264, 376, 590, and in one case 12,280. In addition to these filthy contributions the Irwell had to receive the contaminated waters of the Irk and Medlock—rivers which were little better than open sewers. The Salford sewage contained 142 parts of solid matter per 100,000 parts, the Irwell as it entered Salford 70, as it left Salford 85, the Irk 120, and the Medlock 112. In conclusion, Mr. Bell described the electrical and polarite processes of sewage purification, and exhibited a number of samples of Irwell water, which were passed round the room for examination.—The discussion was adjourned, and the meeting concluded with votes of thanks to Mr. Hart and Mr. Bell.

GLASGOW AND SCOTTISH SECTION.

THE opening meeting of the new session, 1890-91, took place in the Society's rooms, 207, Bath-street, Glasgow, on the evening of Monday, the 3rd. inst. Mr. C. A. Fawsitt occupied the chair. Mr. R. Haig, as the first feature of the proceedings read a paper on "A mechanical retort, with continuous feed and discharge," being a description of the parts and action of a new retort, the patent of the retort-manufacturing firm in the neighbourhood of Glasgow with which the reader is officially associated. This mechanical retort, it appeared from the reading, is not altogether a brand new invention, but rather a form of retort for some time well known, but now so much improved and developed as almost to be worthy of being described as something quite novel. The retort is now in practical employment, and

with results, it is claimed, which are in a high degree satisfactory. The heat in this case is applied by radiation rather than by conduction. Although it is called a mechanical retort for convenience, the crude material acted on for distillation is not automatically kept in a condition of uninterrupted motion, but the scrapers, which form a part of the equipment, are moved from the outsides at brief intervals, with the result that the heat gets at its work under circumstances the most favourable possible. The charge is introduced continuously, and the rate of through-put varies according to the substance under treatment, from half an hour to two hours. Whether used for wood or shale, Mr. Haig says, the quality of the distillate is excellent, and the economy in the consumption of fuel beyond question. There was on the agenda paper for the meeting an address on the subject of "Spontaneous Heating," by Mr. R. R. Tatlock, city analyst of Glasgow; but owing to a misconception, in which not a few of the other members shared, that gentleman took for granted that Tuesday would be the day of meeting as usual, and on Monday night, put in no appearance in consequence. It is more than likely that Mr. Tatlock's paper will be one of the items at the next meeting. The attendance, owing partly to the unlooked-for change of day above referred to, was thinner than usual.

BONE DUST.

THE INFLUENCE OF FINENESS AND FREEDOM FROM FAT ON SOLUBILITY.

IT is a remarkable fact that purchasers, especially in France, do not seem to pay any attention to the quality of manures made from bones.

An ordinary product of good percentage will sell well, although it may be badly ground, full of grease, and very irregular in its action whereas a good sample, freed from grease, dry and finely ground, will scarcely find purchasers at a slightly higher price. This state of affairs exists in spite of the fact that the useful effects of bone dust as a manure is known to depend on its fineness, freedom from grease, etc.

On this last point, everyone agrees that the presence of fat is an obstacle to the decomposition of organic products. Bones, hair, fur, etc., long resist decomposition when burned, without being previously freed from fat. Crude bone dust has a very feeble fertilizing action, whilst bones, which have been well freed from grease and partially decomposed by heat, are much more easily assimilated, because their decomposition in the soil takes place much more rapidly.

The effect of the fineness of the powder is not less certain, moreover, when mineral phosphates are purchased, the buyer takes care to insure perfect grinding, by insisting that the product shall pass a sieve of a certain definite mesh. This is not required in the case of bone dust no two products put upon the market are alike, and (apparent) cheapness seems to be the only quality desired by the purchaser.

We append the results of the chemical examination of the relative absorption of a first-class finely ground meal and various other products.

The first table shows the composition of the sample (type No. 1), which has been taken as the standard of comparison.

BONE MEAL, TYPE NO. I.

(Chemists: Maret and Delattre. Bulletin No. 4,077.)

Nitrogen	4·01
Phosphoric Acid	24·24
Equivalent in Tilharic Phosphate of Lime	52·92

RELATIVE ABSORPTION.

Solubility in ammonium oxalate.

(Chemist: H. Toulie.)

	Per cent.
Bone Ash (American)	35·00
Bone Dust, not freed from Gelatine	64·37

(Chemist: A. Vivien)

Bone Dust, not freed from Gelatine	51·73
Bone Meal (Indies)	14·94
Bone Meal (type No. 1)	72·22

(Chemists: A. Vivien and P. Durin.)

Basic Phosphate Slag	13·30

SOLUBILITY IN ACETIC ACID.

(Chemist: A. Vivien.)

	Per cent.
Bone Dust, not freed from Gelatine	58·80
Bone Dust, (Indies)	32·03
Bone Meal (type No. 1)	74·48
Basic Phosphate Slag	12·00

THE PRODUCTION OF CASTOR OIL IN SENEGAL.

THE French *Moniteur Officiele du Commerce*, publishes a report which the French Colonial Office has received from M. Carstaing, on the subject of the cultivation of the castor oil plant in Senegal.

In, June, 1888, M. Carstaing drew the attention of the Governor of the French colony of Senegal to the advantages which would accrue from the cultivation of the indigenous castor oil plant, particularly the species which spontaneously decorticates itself in the sun, and which M. Carstaing had discovered in his entomological rambles. The Government agreed to undertake experiments in this direction, and at the end of June, 1888, 10,000 seeds were sown in a plantation at Sor, near St. Louis, and 6,500 were distributed to private persons to experiment upon, at the public cost.

The extreme dryness of the climate had prevented the success of several other attempts of a like kind, such as those with arachides nuts, millet and beans. It was, fortunately, found that the castor oil plant was able to resist this obstacle, and in its first season the plantation at Sor produced 300 kilos. of good seeds. In May, 1889, other plantations of castor oil were founded at Dakar-Bango, Louga, Kelle and Thies. By the close of December, 1889, the Government was able to announce that those new areas of cultivation had proved twice as successfal as anyone had dared to hope. The plants had in six months grown, at Thies and elsewhere, to a height of from 3 to 4 metres with a rich crop.

During the rainy season of the present year a great number of applications have been made by planters in various parts of Senegal for seed of the best quality. and fresh plantations have been opened with 1889 seed in Rufisque, Goree, and other places. It has been so clearly shown that the soil and climate of Senegal are favourable to the growth of the castor oil plant, that preparations are being now made for a very wide cultivation of it throughout the colony in February, March, and April of next year. The principal difficulty in the way of this new industrial enterprise is the resistance of the natives, who cannot be persuaded that arachide nuts and castor oil can be simultaneously grown in the same piece of ground. This is quite a mistake; however, by planting the castor oil plants of the first year sufficiently sparsely, success is certain.

The principal trading houses of Bordeaux and Marseilles have promised to support the colony of Senegal in the production of castor oil, by offering a market for the product. They consider that the new industry will prove a source of immense wealth to the colony, the present prices being highly advantageous. The accident that the crops of arachide nuts have lately been a failure make the Administration of Senegal only the more anxious to secure this new and valuable product. Offers have already reached St. Louis from two American houses, and it is believed that the colony will have no difficulty in selling what it produces.

The numerous uses to which castor oil is now put are very encouraging to the cultivation of the plant. It can be utilised, beside in its medicinal capacity, in dyeing, soap making, greasing machinery, lighting, printing, the manufacture of Dutch cheese, exported butter, for cement in Java, and for food in China; the Chinese boil castor oil with sulphate of alumina and sugar to remove the bitter taste.

PEILE'S PATENT FLOATING DISINFECTANT.

WE have received samples of this handy application of existing disinfectants, and can safely say it is a step in the right direction, as by it the three essentials of efficiency, simplicity of application, and uniform solution, would appear to be accomplished. The invention may be described as follows. A mixture of carbolic acid and other disinfectants is prepared in a solid form, the important feature of which is that it will float in water, and is therefore always visible and accessible, this is thrown into the water which is to be disinfected, or, used as a disinfectant, floats upon it and is slowly dissolved. By this means it is claimed that a uniform rate of solution is obtained, which is of great advantage. It will be seen that this disinfectant is specially adapted for use in closets and urinals. All that it is necessary to do, is to place a block of the "Floating Disinfectant" in the water cistern supplying the closets. As it floats on the surface of the water it gradually dissolves away, mixing perfectly with the water used in the closets. All danger of blocking up the pipes is avoided, as the disinfectant is always on the surface of the water.

The "Floating Disinfectent" should prove of great value, owing to its extreme simplicity of application.

The great difficulty in inducing people to use disinfectants is their dislike to the trouble of mixing and measuring them—as usually supplied.

PLATINUM.

THE price of platinum has recently advanced very greatly, until now it is nearly equal in value to gold. In July, 1889, the price was 8 dols. (33s. 4d.) an ounce, six months ago it was 14 dols. (58s. 4d.), and at this writing it is 20 dols. (83s. 4d.) an ounce, while gold is quoted at 20·70 dols. (86s. 4d.). This rapid rise in the value of the metal is due to the steadily increasing demand from manufacturers of electrical apparatus. Every incandescent electric lamp requires about one inch of platinum wire, and nothing has yet been found to take the place of it. Large sums of money have been expended in the prosecution of experiments having for their object the discovery of a substitute for platinum wire in the manufacture of electric lamps, but without satisfactory results. In the Edison incandescent lamp the copper conductor is attached to a short piece of platinum wire as it enters the glass pear-shaped globe, and the platinum joins the carbonized bamboo loop. The reason why platinum is so indispensable is that that metal and glass expand at very nearly the same temperature. If this were not the case, and there was unequal expansion from the heat of the lamp, the seal of the glass globe would be broken and the light soon extinguished. The history of this metal is most interesting, and its characteristics are very remarkable.

During the first half of the sixteenth century it was observed that the gold ore from the mines at Darien, in South America, included grains of a whitish metal which was deemed to be a noble metal, and yet it differed in a marked degree from silver. The fact of the discovery of this metal was not made known by the Spanish government, because they found that it furnished an excellent material for adulterating gold, and none of it was allowed to be exported. It was only at about the middle of the last century that the metal began to find its way into Europe, where it became known as a curiosity under the Spanish name of platina del Pinto (the little silver from the river Pinto). The principal source of the supply of platinum is from the Ural Mountains, but it has also been found in the provinces of Choco and Barbacos, New Granada, and in Brazil. It occurs also in San Domingo, on the island of Borneo, in Honduras, among the sands of the Rhine, and in the County Wicklow, Ireland. It is also met with in California, at Rogue River, Oregon, in Rutherford County, North Carolina, and in Canada.

The Ural Mountain deposits were discovered about 1823, and they have been worked by the Russian government since about 1828. According to Daubre, the Ural ore was embedded originally with chrome iron in a serpentine derived from olivine.

Platinum ore is found in alluvial districts in the *debris* of the earliest volcanic rocks. It is generally found in small grains, but masses of considerable size have been discovered, and several of these have been preserved as curiosities. The Demidoff museum contains a native platinum lump weighing 21 pounds troy. Humboldt brought a piece from South America weighing 1,088 grains and having a specific gravity of 18·94, and deposited it in the Berlin museum. In 1822 a specimen from Condato was placed in the Madrid museum which was 2½ inches in diameter and weighed 11,641 grains. When found in its native state, it is in rounded grains or nuggets, or in flattened scales worn smooth by attrition in the gravel of river beds.

On the northern coast of California, a mixture of gold and the platinum metals in extremely small scales is washed from the beach sand, and from this mixture the gold is removed by amalgamation.

From observations made of the rocks and minerals found with platinum in deposits, the theory has been formed that the metal is chiefly derived from the disintegration of serpentine rock.

Nearly all the native platinum is more or less magnetic. There were several specimens of this kind in the collection sent to the Paris exposition, in 1867, by Prince Demidoff, upon whose estate in Russia there are a number of places where large masses of the ore have been found.

Platinum was coined by Russia to the extent of $2,500,000 (£512,000), between 1826 and 1864, when the coinage was discontinued.

Almost all platinum contains iridium, which greatly increases its hardness and durability without impairing its power of resisting chemical agents, and it has been termed the metal of the chemist. Liebig said that "without platinum crucibles, which share the infusibility of porcelain, with the chemical inertness of gold ones, the composition of most metals could not have been ascertained, and chemistry could not have come to its present level." The unalterability of this metal at high temperatures, and its power of resisting the action of most chemical agents, makes it invaluable for crucibles, evaporating dishes, forceps, and foil for blowpipe experiments. One of its most important uses is for large evaporating stills for the concentration of sulphuric acid. A still of this kind valued at 19,000 dols. (£3,891.), exhibited at Vienna in 1873, was capable of concentrating 20,000 pounds of sulphuric acid daily. A well-known oil-refining company located in New York City paid 24,000 dols. (£4,915.) for a still of this kind to be used in their business. The joints of these stills are autogenously soldered, thus giving them entire uniformity of material, and making the whole vessel of one piece. It would not, however, be possible to produce such large homogeneous vessels without the aid of the blowpipe.

As early as 1837, Dr. Hare, of Philadelphia, proposed to melt platinum and he succeeded in melting 28 ounces into a malleable, homogeneous mass. MM. Deville and Debray have conducted a number of successful experiments with platinum, so that ingots of large size can now be made.

Still another use to which platinum has been put is in the manufacture of jewellery. Its dull, steel-gray colour prevents it from being ornamental in itself, but it is plated with gold, and large quantities of it have been used in this way. If the prevailing high price is maintained, however, platinum can no longer be used in this line of manufacturing. It is thought by some that the prevailing high price will stimulate the production of the metal in Russian fields, where large deposits are believed to exist.—*Scientific American.*

PREPARING ALKALINE CYANIDES.

A NEW patent for preparing alkaline cyanides has been taken out in Germany by H. Grünberg, Cöln, H. Femming, Kalk, and W. Siepermann, Elberfeld. When gaseous ammonia is passed over a mixture of charcoal and carbonates of the metals of the alkalies heated to redness, small quantities of cyanides of those metals are formed, together with large quantities of cyanates of the same metals; if the mixture be heated to bright redness when performing the same experiment, cyanides alone are formed, but the amount obtained is small. If, however, ammonia be passed first over the mixture while it is at a dark-red heat, the supply of ammonia then cut off, and the mixture raised to a bright-red heat, the cyanates of the metals of the alkalies first formed will be reduced to cyanides and the yield will be much improved. The apparatus serves to carry out these reactions continuously, and to enable the cyanides of the metals of the alkalies to be produced in two stages. The vertical retorts are built in an oven, whose flues are arranged in such a way that the lower part of the said retorts can be heated to light red and the upper part to dark red. The retorts have each a short additional pipe or length on its lower part, which projects beyond the oven, in which the product of the reaction cools, and is through the motion of an endless band, or other suitable manner continually or intermittently discharged into a receiver. A cooling pipe, an arrangement for drawing off liquid, and receiver are so arranged that an outward escape of gases cannot take place, and therefore the gases involved in the retort are compelled to take their upward course. Close-shutting funnels or hoppers are placed on the retorts, through which pass sufficiently large pipes for letting out the evolved gases. Through each of these pipes a longitudinal adjustable pipe of smaller diameter passes, which pipe serves to introduce the ammonia. The action of the apparatus is as follows:—Coarse charcoal and carbonate of alkali are supplied to the retorts through the hopper, and when the retorts have attained the desired temperature the pipe is removed, so that its lower end is opposite that part of the retort of a dark-red heat, and a steady stream of ammoniacal gas is introduced, and the re-acting substance led off into the receiver. A revolving drum is provided in the side flues for drying the substance to be treated. The salts formed in the apparatus are dissolved out, and the cyanide in solution can then be separated out by one of the methods in ordinary use. For the manufacture of cyanide of potassium the salts are dissolved out until the resulting solution shows 40° Beaumé. This solution is then supersaturated with carbonate of soda at ordinary or higher temperatures. In the former case the potassium cyanide precipitates at once, in the latter case it does so as soon as the solution cools. Three claims are made embracing the construction of the apparatus as described, and the precipitation of potassium cyanide from its aqueous solution by sodium carbonate, as described.

COMPRESSED AIR FOR POWER DISTRIBUTION.—A pamphlet has been published by Dr. Proell on a scheme for compressed air for power distribution for Dresden. The erection of steam boilers is prohibited within the city limits, and high-tension electric currents were objectionable. The pamphlet gives in detail a project for supplying 7,500 indicated horse-power. Ten triple-expansion condensing engines working under 150 lb. initial pressure, of 750-horse-power each, are provided for. The air compressors have 27½ in. cylinders and 49·2in. stroke, same as the engines, and are fitted with Proell valve gear, Riedler double-beat valves, and external water jacket. The twenty compressor cylinders are to produce 2,200,000 cubic feet of air of 120 lb. pressure per day. The motors are of novel design for utilising the compressed air, the leading points being the heating of the air during expansion and at the same time injecting a water spray.

TESTS FOR THE PURITY OF ALCOHOL.

E. MOHLER recommends the use of a mixture of the following solutions for the detection of aldehydes in alcohol: 30 cc. of a solution of fuchsine of 1 part in 1,000; 20 cc. of a solution of sodium bisulphite of a specific gravity of 34° B.; 3 cc. of sulphuric acid; and 200 cc. of distilled water. Four cc. of the freshly-prepared liquid should be added to 10 cc. of the alcohol under examination. The solution does not act on alcohols and ether, but will serve to detect the various aldehydes by the colouration. It will not answer, however, for quantitative tests, as the colouration produced is not proportional to the impurity present. Acetate of aniline in acid solution is a good reagent for furfurol, as it does not react with other alcohols, aldehydes, and ethers. As small a quantity as one milligram of furfurol per litre of alcohol can be detected by this means. Permanganate of potassium in acid solution was found to be decomposed by paraldehyde, isobutylic aldehyde and isobutylic alcohol, the reduction being proportional to the amount of aldehyde present. It can be used to distinguish ethylic aldehyde from paraldehyde, the latter instantly reducing the permanganate. The full intensity of colour of the anilin reagents requires about half an hour for development. Mohler's investigations showed that the reagents generally employed are reliable only within certain limits. He ascertained that certain impurities might be present which could not be detected by sulphuric acid, as they yield no colouration with it. With bisulphite of rosanilin the reaction obtained will depend much upon the relative proportion of sulphuric acid and bisulphite of sodium in the reagent employed, even pure alcohol being coloured, if only a little acid be used, whilst if both the ingredients are present in too large quantity, one-thousandth part of ethylic aldehyde cannot be detected.

Selected Correspondence.

MINING IN GERMANY.

A CORRESPONDENT writes to the *St. Helens Newspaper and Advertiser* as follows:—

"As there are at present so many different opinionsand controversies about the eight hours' working day for miners in this country, I hope you will kindly give me a little space in your valuable paper to state my personal experience of the eight hours' system, and the general rules and laws of mines and miners in Germany when I left that country twenty-five years ago, and I hope the men will consider the same.

In Germany the laws at that time were, and had been as long as I can remember and I have never heard that they ever have been more there, only eight hours per day, and no boy was allowed to work in a mine until he was 16 years of age. These laws were enacted by Parliament to protect the health, growth, and development of men and boys, otherwise they would not be fit to serve king and country, and to defend the same against their friendly and well-beloved neighbour.

In Germany we have three classes of miners—1st, 2nd, and 3rd. The third class consists of drawers and labourers, in which they have to be three full years and pass a mild examination before they can enter the 2nd class. In this class they have to be five years, when they may enter the 1st class, provided they pass a severe examination. They have to know all the workings of a mine, the gases, the regulation of the air, to drive tunnels, to set timber and other workings of a mine. The masters are fined if they send a 3rd class man to get coal unless a 1st class man is with him. The masters cannot discharge a 1st or 2nd class man unless he has done something very wrong, when they can report him to the Government Inspector, who has power to put a fine upon him and to reduce him to the 3rd class again.

Coaling and drawing is piecework; the drawers are engaged and paid by the masters, not by the miners. The standard of wages as fixed by the Government was in my time—1st class, 25 thalers; 2nd class, 20 thalers; and 3rd clas, 15 thalers *per month* (a thaler is 3s.) A miner can also be transferred from one pit to another nearer to his home, if he so wishes, by the mining inspector; but should the masters refuse to take him without a good reason they are bound by law to pay him the above wages until they find him a place (the 3rd class is not under this rule).

The masters are protected on the other hand; the miners have to work six days a week or forty-eight hours, except through illness, which is the only excuse. They wind coal for two shifts—morning shift from four to twelve o'clock, afternoon from twelve to eight o'clock; the night shift from eight to four for general repairs.

If a man gets killed in a mine, word is sent all round and work ceases at once for that day; should he be a 1st or 2nd class he is buried with honours like a soldier here. The above two classes are bound to follow the deceased in uniform, headed by a band, in procession to the grave: which made always a great impression on me, and I may also say on the whole town—in fact miners are a good deal thought of, a good deal more than other tradesmen; and as long as a young woman can get a miner there is no chance for any other young tradesman.

There is also another good system, it would be well if that system would come here; the men go to their work in their clean clothes and come back in the same. The masters of nearly all the pits have erected (voluntarily) buildings with two or three stoves in them to keep the same warm, and provided with cupboards (one for every man), with lock and key, for them to lock up their clean clothes when they go down, and their working clothes when they go home. At one end of the building is a large tank filled with warm water, for the men when they come up; they strip themselves, go into the water, wash themselves all over, and put on their clean clothes again, and so they go home and show their wives clean husbands. When trade was bad our working days were reduced.

Some of the colliery masters had also another good system, which is, that half-an-hour before the time to go down, the underlooker came, and called over the names of those that had to go down. When that was done he read prayers from a large prayer-book provided for the purpose, and no man was allowed to go down till then. This ought to be done everywhere, for I once heard a good clergyman at a funeral make the statement, that where that system was observed, accidents were over one-half less than in those pits where it was not observed. In this we all know he was right.

Now, I can not see why it cannot be done now as it was done then, and I have no doubt the same system will be in force again if they have departed from them, if the Emperor's words can be relied upon. I think we may safely do that. If this is done in Germany why can it not be done in Christian England?

I believe it can be done if masters will follow the Humane Banner, the working-men the Honest Work Banner, then all this Kilkenny-cat work would be unknown.

I challenge any one to contradict the above statements.

The parts of Germany I have referred to is the Province of West phalia, of which the principal mining districts are Essen, Dortmund, Bochum, Witten, and Steble."

NOTICE.

WE have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on be first Tuesday in each of the following months; they will the illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

DYEING ANILINE BLACK.—An improved method of dyeing aniline black, which has been patented, consists in employing a mixture of the solution of the aniline salts, with a solution of such matters as coagulate immediately into an insoluble combination with the re-agents, especially with chromic metallic salts, usually employed for the oxydation of the aniline, and so carry along the aniline salt, and secure it on the staple. Such properties are shown by the so-called proteine compounds—albumen and caseine, as well as their kindreds—the glutinous liquids, namely, glutine and chondrine. A 10% solution of glue is prepared by stirring and boiling, and 20% of aniline hydrochlorate is added. The mixture will become clear at once, and remain quite thin and flowing in a cold atmosphere. The matters to be dyed are now soaked in this solution, then they are either pressed or swung, and treated, either at once, or after a slight drying, with a solution of chromic acid, or its salts, and salts of the oxides of copper or iron, with or without addition of oxydizing materials, such as combinations of oxygen with chlorine and manganese, until the aniline black is fully developed. If caseine is to be used as a coagulating body, a 5% solution of the same is made by boiling with aniline salt and free aniline prepared. When using albumen from blood or eggs, the operation of dissolving and soaking should naturally be performed in a cold atmosphere.

Correspondence.

***We do not hold ourselves responsible for the opinions expressed by our correspondents.*

ANSWERS TO CORRESPONDENTS.

VALLE.—On the 18th ulto.

M.M.P.M.—The percentages were given in the article.

G.H.A.—Why not try the experiment if you have a laboratory.

NITRO.—Have nothing to do with trichloride of nitrogen, it is dangerous The idea of using explosives to propel tricycles is not new.

OXY.—20·8 per cent by volume.

Trade Notes.

THE LONDON WATER SUPPLY.—The average daily supply of water to London delivered from the Thames during September last was 96,184,730 gallons; from the Lee, 60,404,461 gallons; from springs and wells, 27,458,304 gallons; from ponds at Hampstead and Highgate, 364,682 gallons. The last is used for non-domestic purposes only. The daily total was, therefore, 184,412,177 gallons for a population aggregating 5,678,840, representing a daily consumption per head of 32·47 gallons for all purposes.

SEWAGE DISPOSAL.—The works of sewerage and sewage disposal for the town of Maldon, Essex, were opened by the Mayor and Corporation on Tuesday, the 4th inst. The works have been successfully carried out from the designs and under the superintendence of Messrs. R. B. Grantham and Son, of Northumberland-avenue, by Mr. G. Osenton, the contractor, Mr. John Wood acting as clerk of works. The Town Council has determined to form a promenade along the frontage of the river Blackwater, and to lay out a recreation ground in connection therewith.

ELECTRIC LIGHTING IN AMERICA.—It is claimed that there is now a central lighting and power station in operation in every town of any importance in the United States. A recent estimate shows 1,376 electric stations in that country, and that £23,752,000. has been invested in this form of enterprise. For illuminating purposes there are 127,441 arc lights and 1,590,967 incandescent lamps; while to work this vast system, engines having an aggregate capacity of 356,755 horse-power, are employed.

VOLATILE HYDROCARBONS AND FIRES.—Messrs. Rowley and Brock, at whose works in Smithfield the recent fatal fire occurred, were summoned to the Southwark Police Court, on Tuesday, at the instance of the London County Council, "for that they did, on or about the 3rd day of November, 1890, at No. 1A, Earl Street, St. George's, Southwark, keep a quantity of petroleum without possessing the licence required by the Act." The defence was that the "rubber solution," used by the defendants, was not an explosive within the meaning of the Petroleum Act, 1871. The magistrate inflicted a fine of £20. for one day's illegal storage of petroleum.

SEWAGE PRECIPITATION AT EARLSHEATON.—On Tuesday, November 4th, Mr. J. T. Harrison, M. Inst. C.E., held a Local Government inquiry at the Board-room, Earlsheaton, near Dewsbury, relative to an application by the Soothill-Nether Local Board for sanction to borrow £12,000. for the purpose of carrying out a complete scheme of main drainage and sewage treatment. Mr. W. C. Handley, Clerk to the Board, stated that the population of the district was about 5,750; the effective ratable value, £13,113.; and the amount of the present debt, £1,530. Mr. Malcolm Paterson, M. Inst. C.E., Bradford, the Board's engineer, produced plans and sections of the scheme, and explained the details. The scheme is entirely by gravitation, there being two main outfall sewers meeting at one point, and the method of treatment proposed is chemical precipitation in three tanks working separately, combined with filtration on land specially prepared to a depth of 5ft. or 6ft., the total area being four acres. The principle features of the scheme are (1) separation of the storm water from the sewage; (2) utilization of the fall of sewage for mixing chemicals; and (3) the taking of the manufacturing refuse into the sewers, thus striking at the root of river's pollution, a step which, in view of the terrible state of the river Calder, will doubtless be watched with interest by the West Riding County Council. The inspector advised the acquisition of the land at once by conditional agreement, and stated that in no case would the Local Government Board sanction the discharge of sewage clarified by precipitation, without its passing overland, not even the supernatant water periodically discharged before cleansing the tanks, and further stated that, with this proviso, he would recommend the granting of the application.

Market Reports.

MISCELLANEOUS CHEMICAL MARKET.

The position of all products of the alkali trade has been strengthened by the union of the principal works in the United Kingdom, now practically consummated by the registration of the United Alkali Co., Limited, and the issue of the prospectus to all the connections of the trade. The value of caustic soda 70% remains steady and firm at £11. 10s. per ton f.o.b., and all other strengths are in the usual ratio. Soda ash is in strong demand, and stocks at makers' works are low. Business doing both for prompt and forward delivery at 1⅜ to 1$\frac{7}{16}$ per deg. for ordinary brands of caustic and carbonated ash f.o.b. Soda crystals steady at £3. 5s. to £3. 10s. on rails. Bleaching powder has further hardened during the past week, and has especially advanced on the hardwood packages for export, now quoted at £7. per ton f.o.b. Softwood casks on rails, £6. 7s. 6d. to £6. 10s. per ton, the latter quotation being also the price for 1891 deliveries. Sulphate of copper is rather more enquired for, and price is £19. per ton f.o.b. for early and forward delivery. Vitriol is in good demand, with firm prices all round. Chlorate of potash has been selling more freely at 5⅜ per lb. by resellers, makers now quoting 5½. Acetates of lime firmer, both for spot and forward deliveries. Demand for potash continues brisk. Carbolic acid crystals are quiet, and under extreme depression of values the market has been considerably curtailed. Prussiate of potash scarce and firm at 9¾d. to 10d. Citric and tartaric acids are steady. Oxalic acid quiet at 3⅝ per lb. The general demand for chemicals in textile trades is at present by no means brisk.

TAR AND AMMONIA PRODUCTS.

Prompt benzole remains scarce; prices are, however, rather easier for next year's delivery, and it is most probable that 90's could be bought for 4s. 5d. and 50/90's, at 3s. 5d. Most other tar products are steady. Anthracene is quoted at 1s. 5d. to 1s. 6d. for 30% A, and 1s. 1½d. for 30% B. Pitch is firm at last week's quoted rates.

Sulphate of ammonia has experienced a rather serious fall, which has occurred since the Beckton Company reduced their price to £11. 2s. 6d. In London outside makes business has been done at £11. 5s., but the market is quiet in anticipation of a further decline. Some business has been done at Hull at £11. 2s. 6d., but several makers have declined to sell at this price. Leith has also declined, and £11. 1s. 3d. would no doubt be accepted at that port.

THE LIVERPOOL MINERAL MARKET.

Minerals have ruled brisk during the week, and prices continue firm. Manganese: Arrivals somewhat larger; the whole, however, have gone into consumption, and prices are unaffected. Magnesite: No reduction in stocks, whilst sales are slow and meagre. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £11. Bauxite (Irish Hill brand): Production can scarcely keep pace with the demand, and prices have a further upward tendency; lump, 22s.; seconds 18s.; thirds, 14s.; ground, 35s. French chalk: Arrivals continue very small, whilst the demand is strong, and sales have been done in some cases a shade better than last week, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate easier; sulphate: prices for best qualities firmer; "Angel White," No. 1, 70s; No. 2, 60s to 65s; No. 3, 45s. Pumicestone: Lump unchanged; ground easier. Iron ore in fair demand at full figures for native production also Spanish and Bilbao; manganiferous in request, and prices firm. Santander, 9s. to 10s. 6d., f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Purple ore steadier. Emerystone: best brands scarce, prices firmer. No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal in request without alteration in prices. Chrome ore in more demand, especially for best grades—prices somewhat better. Antimony ore and metal maintains the strong demand at full prices. Asbestos in strong demand, especially Canadian rock. Potter's lead ore: "standard" brands in request; smalls, £13 to £14.; selected lump, £15. to £16. Calamine: Good qualities in demand at advanced prices.

Strontia sulphate (celestine) inquired for 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, steady. Plumbago: Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, firmer—20s. to 22s. 6d. Ground mica, £50. China clay: Easier; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), inquired for, finest quality 22s.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The market is rather idle, but highly expectant of something or other surprising. Caustic soda is practically unaltered and very quiet of tone, but bleaching powder is in brisk inquiry, with some considerable anxiety on the part of consumers, on the score of the forward supply. The effect of the consummated Union of the Alkali Manufacture of Great Britain is still only a subject of the vaguest conjecture amongst consumers and dealers, even after perusal of the prospectus issued by the Council. Outside the alkalies, the main feature on the market is the serious collapse in sulphate of ammonia values, which gave way rather disastrously a few days ago, speedily touching a transaction at £11. 2s. 6d. Leith, with very serious apprehensions, on the part of makers and others, that it was likely to go lower. The makers blame the middlemen for the mischief, charging them with precipitation in throwing their lots unnecessarily on the market. The middlemen are inclined to ascribe the drop to the lowered nitrate values, but it is evident that dealers are severely nonplussed and the market, generally, demoralised. Next to bleaching powder, the paraffin section is the stiffest at the moment; all the values being maintained, with some slight improvement in burning oil alleged. Bichromates are still in somewhat unsatisfactory demand. Chief prices current are: Soda crystals, 56s. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅛d. less 3½%, Tyne; caustic soda, white, 76°, £13. 5s., 70/72°, £11. 5s., 60/62°, £10. 5s., and cream, 60/62°, £9. 17s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £7., and 1 cwt. casks, £7. 5s., net Tyne; refined alkali, 48/52°, 1⅛d., less 3½%, Tyne; saltcake, 40s.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £6., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5⅛d., less 5% any port; nitrate of soda 8s. to 8s. 3d.; sulphate of ammonia, £11. 1s. 3d. to £11. 2s. 6d. f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18. 10s, less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb; paraffin wax, 120°, semi-refined, 3⅝d. to 3¾d.; paraffin spirit (naphtha,) 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 10s.; and 890/895°, £7. 15s. to £8. Week's imports of sugar at Greenock were 71,351 bags.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron steady. Scotch warrants closed at 51s. 3d. cash and 51s. 7d. one month. Middlesbrough, 48s. 6d. cash; hematite, 58s. 2d., cash. Copper rose 5s. to 10s. Chili bars, G.O.B.'s and G.M.B.'s closed at £57. to £57. 7s. 6d. cash, and £57. 10s. to £57. 17s. 6d. three months. Tin rose 10s. Straits closed at £94. 12s. 6d. to £95. 2s. 6d. cash, and £95. 2s. 6d. to £95. 12s. 6d. three months; Australian, £95. cash. English ingots, £98. Lead: Spanish, £14. 2s. 6d.; English, £14. 7s. 6d. Silesian Spelter: ordinary, £24. 15s. to £25. Quicksilver, first hands, £10.; second hands, £9. 15s. Copper shares: Cape, 4¾ to 5; Copiapo, 2 11/16 to 2 13/16; Libiola, 2 1/16 to 2 3/16; Mason and Barry, 6¾ to 7; Namaqua, 2⅞ to 3; Panulcillo, ⅞ to 1; Rio Tinto, 23⅜ to 23⅝; Tharsis, 5¾ to 6.

GLASGOW, Wednesday.—Market flat, with a fair business. Scotch done at 51s. 5½d., 51s. 3d., and 51s. 3½d. cash, also at 51s. 9d., 51s. 6d., and 51s. 6½d. one month; closing buyers at 51s. 3d. cash, sellers ask ½d. more. Middlesbrough closes with buyers at 48s. 6d. cash, sellers ask 48s. 7½d. Hematite done at 58s. 3d. cash; closing buyers at 58s. 2d. cash, and 58s. 5d. one month; sellers ask 58s. 4d. cash, and 58s. 7½d. one month.

WOLVERHAMPTON, Wednesday.—On 'Change in Wolverhampton this afternoon a fairly good tone prevailed. Stocks of pig iron in consumers' hands are not large. Cinder pigs are quoted 45s. Galvanised sheets are in better demand for South America and India at £12. 17s. 6d. for corrugated doubles in bundles f.o.b. Liverpool. Derbyshire and South Wales hard coke is quoted 17s. to 18s. delivered; Staffordshire and better qualities 20s. to 22s.; Staffordshire forge coal is quoted 8s. to 10s. 6d., and furnace 9s. to 14s.

REPORT ON MANURE MATERIAL.

The market during the past week has been quiet, with prices for both phosphatic and nitrogenous material still tending in favour of buyers.

For cargoes of hot-air-dried Bull River rock, c.i.f. to U.K., the price is still 11d. per unit, but land rock can hardly be quoted at over 10d. per unit. Quotations for Canadian remain unchanged, and we do not hear of any business for this season, though large sales of 80% are reported for shipment next season to the Continent at fully this season's price. Florida shipments are again being more freely offered, but manure manufacturers are shy of buying in quantity until they become better acquainted with this phosphate. Somme and Belgian description may be had at some reduction on nominal values, there being several sellers desirous of moving stocks.

Nearest value of cargoes of River Plate bones is probably £5. 7s 6d., delivered U.K. East Indian bone meal may now be had at £5. 7s. 6d. per ton ex quay, and there have been sales at the price. For crushed East Indian bones the price is £5. 5s. to £5. 6s. 3d., according to position, delivered ex quay Liverpool. The nominal value of common grinding bones is £4. 17s. 6d. to £5, according to quality, but there are none offering on spot.

Nitrate of soda remains very quiet at 8s. per cwt., ordinary quality, 8s 3d. per cwt. for refined, on spot. Due cargoes are worth barely 8s. per cwt., and it is doubtful whether much over 8s. could be got for October-November shipments.

We do not hear of any further business in dried blood or River Plate guanos.

Superphosphates remain as last quoted, without much business passing.

The depression in all other trades has no doubt had its effect upon the market for manure material, and, the manure season being still some months ahead, manufacturers are naturally disposed to look on until they see in what direction trade in general is likely to go.

THE COPPER MARKET.

Messrs. Harrington and Co., in their copper report, dated Liverpool, November 3rd, 1890, states:—Chili copper charters for second half of October are advised as 1,400 tons. Exchange 23⅜d. The total charters since 1st January are 21,800 tons, against 18,300 tons for same time last year.

Since our last, the market for G.O.B.'s and G.M.B.'s has been irregular, owing to the unsettled state of the Stock Exchange, and prices have fluctuated from day to day, but the highest price touched during the fortnight was £59. 2s. 6d. cash and £59. 7s. 6d. forward, the lowest being £58. 5s. cash, and £58. 7s. 6d. forward.

The present stock of English G.M.B.'s in warehouse, owing to 300 tons having gone into Swansea stock, and the deliveries in both Swansea and Liverpool only amounting to 107 tons, shows an increase for the fortnight of 193 tons, making the stock 4,034 tons, against 3,841 tons on the 15th ult.

Refined and manufactured sorts are quiet at £62. to £63. for tough, £65. 10s. to £66. 10s. for best selected, £66. 10s. to £67. 10s. for India sheets, £70. to £71. for strong sheets, and 6¼d. to 6½d. for yellow metal sheets.

There is an increase in the Liverpool, Swansea, London, and Havre stocks for the fortnight, of 382 tons, but owing to a decrease of 1,413 tons for the previous fortnight, the decrease for the month is 1,031 tons.

The visible supply for the month of October is 68,225 tons, against 69,906 tons for September, thus shewing a decrease of 1,681 tons.

The sales of furnace material comprise at Liverpool—45 tons Seville precipitate, at 12s. 6d.; 50 tons English precipitate, at 12s. 6d.; 100 tons Mexican ore, at 11s. 4½d.; 57 tons Chili regulus (out of old syndicate stock), at 11s. 7½d.; 9 tons Cuban precipitate, at 11s. 9d. to 12s.; 200 tons Portuguese ore, to arrive, at 9s. 7½d.; 40 tons Mexican ore, 6 to 8 per cent., at 10s; 140 tons ordinary Anaconda matte (out of old stock), at 11s. 6d; and 120 tons Italian ore at 10s. per unit. At Swansea—160 tons Tilt Cove regulus; at 10s. 3d. per unit.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market here is very steady without any alteration in the prices previously reported. There is a good demand for bleaching powder and some makers are said to be fully sold for the present, other products are moving off steadily. The chief event of the week has been the issuing of the prospectus of the United Alkali Co. (Limited) amongst the friends and customers of the chemical manufacturers. The general expression of opinion is very favourable towards the undertaking and it is expected that shares, to a very great extent, will be subscribed for in this district.

The following are the market quotations:

Bleaching powder, for delivery to end of year, £6. and £6. 5s. per ton, less 3½%, for softwood and hardwood casks, over next year £6. 15s. and £7. per ton, less 3½%, respectively. Caustic soda, 77%, £12. 5s. per ton, nett cash; ground and packed in 3-4 cwt. barrels, £16. per ton, nett cash; 70%, £11. 10s. per ton, less 3½%. Soda ash, 48/52%, 1 3/16d. per degree less 3½%; white alkali, 1 5/8d. per degree, less 5%; soda crystals, 55s. 6d. to 56s. per ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; ground and packed in casks 53s. per ton, less 3½%; recovered sulphur, packed in 2 cwt. bags, £4. 10s. per ton, nett; chlorate of potash, 5½d. per lb., less 5%; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton. All f.o.b. Tyne or l.o.r. makers' works.

Durham small coals are very steady, at prices ranging from 6s. 6d. to 7s. 6d. per ton, delivered into craft. Northumberland steam small, easy in price and offering from 5s. to 6s. 6d. per ton, according to quality.

THE LIVERPOOL COLOUR MARKET

Colours rule steady, without change in prices. Ochres: Oxfordshire, common, £10, medium, £12., best, £15.; Derbyshire: common, 40s, medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt, Prepared oxide, 10s 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

New Companies.

COTTON POWDER COMPANY, LIMITED.—This company was registered on the 4th inst., with a capital of £40,000., in £2. 10s. shares, to acquire the patent rights, property, and assets of a company of the same name, and to manufacture cotton powder or gun cotton. The subscribers are:—

	Shares.
H. Andrews, 27, Martin-lane, commission agent	1
H. Green, 1, Fyfield-road, Brixon, accountant	1
W. H. Simmons, 186, New North-road, clerk	1
G. S. Dawson, 43, Gt. Coram-street, accountant	1
H. J. Seomack, 312A North-end-road, S.W., clerk	1
H. Judd, 45, Gt. Coram-street, clerk	1
C. H. Slater, 21, Egmont-street, New-cross, clerk	1

EVANS AND WHITE, LIMITED.—This company was registered on the 30th ult., with a capital of £5,000., in £5 shares, to acquire the goodwill of the business of oil and colour merchants and Italian warehousemen, carried on at 13, St. Andrew's-pavement, Dunsmure-road, and 64A, Londesborough-road, Stamford-hill, under style of Evans and White. The subscribers are:—

	Shares.
W. J. Evans, 13, St. Andrew's-pavement, Stamford-hill, oilman	1
J. J. White, 13, St. Andrew's-pavement, Stamford-hill, oilman	1
J. Sparks, 19, West-bank, Stamford-hill, merchant	1
C. H. Potter, 38, Paignton-road, Stamford-hill, outfitter	1
R. W. Rippon, 38, Paignton-road, Stamford-hill, dispenser	1
W. N. Brown, 49, Vartry-road, Stamford-hill	1
W. Stewart, 11 Paignton-road, Stamford-hill, translator	1

HALL ANTI-MICROBE COMPANY, LIMITED.—This company was registered on the 4th inst., with a capital of £5,000., in £1. shares, to carry on the business as manufacturers and vendors of Hall's Anti-Microbe. The subscribers are:—

	Shares.
W. Walker, 132, Adelaide-road, N.W., engineer	1
A. G. Moore, Broad-street-avenue, book-keeper	1
E. S. Hall, Bromley, Kent	1
T. Watkin Davies, 34, Guilford-street, Russell-square, accountant	1
W. Vaughan, C.E., 64, Broad street-avenue	1
F. E. Walker, 69, Chancery-lane, invention agent	1
C. P. Shrewsbury, 28, Carlton-road, Kilburn, mechanical engineer	1

HORTON AND COMPANY.—This company was registered on the 31st ult., as an unlimited company, with a capital of £2,500., in £10. shares, to purchase the business of chemists and druggists and vendors of photographic apparatus, chemicals, and other materials, carried on at the Park-crescent, Torquay, under style of Horton and Co. The subscribers are:—

	Shares.
G. Cheverton, Tunbridge Wells, chemist	1
W. D. Webber, Torquay, cement manufacturer	1
J. Jordan, Torquay	1
Mrs. E. Wreyford, Torquay	1
Mrs. E. Goss, Torquay	1
Miss E. G. Webber, Torquay	1
Miss A. M. Webber, Torquay	1

OIL, COLOUR, VARNISH, AND ALLIED TRADES ASSOCIATION, LIMITED.—This company was registered on the 4th inst., as a company limited by guarantee to £10. each member, to protect and further the interests of members engaged in the trades mentioned in the title. For purpose of registration, the association is declared to consist of 300 members, and the management will be vested in a committee of not more than 21 members.

SHEFFIELD STEEL MANUFACTURING COMPANY, LIMITED.—This company was registered on the 3rd inst., with a capital of £5,000., in £1. shares, to carry on the business of steel converters and refiners, and manufacturers of springs, files, and similar articles. The subscribers are:—

	Shares.
T. Dyson, Sheffield, printer	1
J. Hallam, Sheffield, hacklepin manufacturer	1
J. Yates, Leeds, engineer	1
P. Unwin, Sheffield, commission agent	1
Miss L. A. Wallis, Sheffield, teacher	1
A. A. Wallis, 289, Crystal Palace-road, S.E., agent	1
Wm. Horne, 170, Lordship-lane, S.E., army and navy clothier	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

F. CHUBB AND J. O. LLOYD, under the style of F. Chubb, Shrewsbury, lime and salt merchants.

A. GOTT AND G. PITT, under the style of G. Pitt and Co., Newlay, near Leeds, glue manufacturers.

WARICK AND WOODALL, Barton-upon-Humber, maltsters.

THE BANKRUPTCY ACT, 1883.

Adjudications.

HUNTER, G. W., Hackney Road, London, E., brewer.

ROWBOTHAM, WALTER, trading as W. Rowbotham and Co., Salford, electrical engineer.

Receiving Orders.

LEA, WILLIAM SMITH, Hanley, cement manufacturer.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Sewage Filters. W. Birch. 17,113. October 27.
Glass Vessels for Storage of Compressed Gases. D. Rylands. 17,117. October 27.
Machinery for Scouring and Dyeing Hanks. H. Lister. 17,137. October 27.
Bicarbonate of Soda. W. P. Thomson. 17,150. October 27.
Artificial Fuel.—(Complete Specification.) R. F. Field. 17,154. October 27.
Manufacture of Gas.—(Complete Specification.) T. G. Springer. 17,158. October 27.
Bleaching Vegetable Oils. E. Hermite, E. J. Paterson, and C. F. Cooper. 17,160. October 27.
Sulpho-acids of a Red Basic Naphthaline Colouring Matter. J. Y. Johnson. 17,168. October 27.
Copper Refining. J. C. Bull. 17,173. October 27.
Elettric Switch.—(Complete Specification.) H. J. Allison. 17,181. October 28.
Coke Oven Doors. G. Love. 17,182. October 28.
Photographic Films. J. E. Thornton. 17,189. October 28.
Smelting Furnaces. F. H. Varley. 17,191. October 28.
Blue Colouring Matters. D. Dawson. 17,195. October 28.
Vulcanising Compounds. C. A. Fawsitt. 17,197. October 28.
Setting Inclined Gas Retorts. L. V. Vestraut. 17,201. October 28.
Plate Glass Anealing Kilns. W. W. Pilkington. 17,204. October 28.
Smoke Consumption.—J. Scott. 17,209. October 28.
Reversing Valves for Regenerating Furnaces. W. Kirkham. 17,214. October 28.
Application of Bituminous Salt. J. Zeller. 17,218. October 28.
Production of Salols. C. Kolbe. 17,221. October 28.
Refining Sugar. H. H. Leigh. 17,232. October 28.
Apparatus for Evaporation and Distillation.—(Complete Specification.) P. Callibures. 17,237. October 28.
Vegetable Parchment.—(Complete Specification.) A. Wilbaux. 17,268.
Electrical Treatment of Sewage, etc. R. Watherspoon. 17,277. Oct. 29.
Peat Fuel. W. Smith. 17,287. October 29.

Uranium Yellow or Compound Oxides of Uranium. A. O. Watkins. 17,313. October 29.
Hot-air Furnace. G. F. Redfern. 17,319. October 29.
Artificial Fuel. J. Morris. 17,321. October 29.
Dyeing Textile Materials in Hyposulphite Vat. C. D. Abel. 17,326. October 29.
Electric Meter.—(Complete Specification.) H. W. Miller. 17,327. Oct. 29.
Bicarbonate of Soda. W. P. Thompson. 17,341. October 30
Reverberatory Furnaces. J. V. Langer and L. Cooper. 17,380. Oct. 30.
Calcination Apparatus. J. G. Galley. 17,385. October 30.
Hydro-fluo-silicic Acid and Fluoride of Silicon. M. Blumrich. 17,392. October 30.
Glass Retorts. T. G. Webb.
Filtering Apparatus for use in the Manufacture of Varnish—R. Wood. 17,446. October 31.
Treatment of Sewage. J. W. Slater, and the Native Guano Co., Ltd. 17,453. October 31.
Compound for Treating Fuel.—(Complete Specification.) H. H. Lake. 17,466. October 31.
Compound for Treating Fuel.—(Complete Specification.) H. H. Lake. 17,470. October 31.
Water Heating Apparatus. W. J. F. Andrews, C. E. Cobley and F. Horton. 17,480. October 31.
Compound for Treating Fuel.—(Complete Specification.) H. H. Lake. 17,484. October 31.
Magnetic Separators. C. W Atkinson and L. B. Atkinson, of the firm of W. T. Goolden and Co. 17,486. October 31.
Brick Driers—(Complete Specification.) J. B. Bayley. 17,503 November 1.
Fuel Feeding Apparatus. J. Murrie. 17,506. November 1.
Filter Presses. J. E. Weyman and J. A. Drake. 17,514. November 1.
Colouring Matters. C. A. Collin. 17,538. November 1.
Fire Grates and Furnaces. G C. Baker. 17,544. November 1.
Iso Eugenol and Certain of its Derivatives. G. de Laire. 17,547. November 1.
Invert Sugar. A. Wohl and A. Kollrepp. 17,557 November 1.
Portable Electrometer. J. J. Rathbone. 17,558. November 1.
Locked Electric Switches. J. A. Iliffe and H. Barton. 17,560. Nov. 1.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending November 1st.

Antimony Ore—

Pt. Douglas,	3 t.	W. Balchin
France,	18	H. R. Merton & Co.
Maryboro	4	Vivian, Younger, & Co.
Pt. Douglas,	6	W. Balchin
New Zealand,	15	J. B Cree

Arsenic—

Holland,	£30.	Burgoyne, Burbidge, & Co.

Acetic Acid—

Holland,	8 pks.	A. & M. Zimmermann
,,	50	Beresford & Co.
Belgium,	1	Leach & Co.

Alkali—

Belgium,	12 c.	T. H. Lee
Holland,	18	A. Hughes
France,	100	Arnati & Harrison

Barytes—

Germany,	31 cks.	W. Harrison & Co.
,,	22	L & I. D. Jt. Co.
Holland,	22	O'Hara & Hoar
,,	70	D. Storer & Sons, Ltd.
Belgium,	19	Leach & Co.
,,	22	O'Hara & Hoar
,,	20	W. A. Rose & Co.
Germany,	23	O'Hara & Hoar

Bromine—

Germany,	£175.	Craven & Co.
,,	175	A. & M. Zimmermann

Boracic Acid—

Italy,	20 pks.	J. Puddey & Co.

Bones—

Brisbane,	1 t.	Leach & Co.
,,	1	N. Z. L. & M. A. Co.
Las Palmas,	2	L. & I. D. Jt Co.
Sydney,	10	Goad, Rigg, & Co.
,,	26	Dyster, Malder, & Co.
B. Ayres,	25	Anning & Cobb
E. Indies,	50	F. J. Cornwell & Co.
Colon,	2	L. & I. D. Jt. Co.
U. S.,	19	H. A. Lane & Co.

Copper Ore—

B. W. I.,	20 t.	R. M. S. P. Co.

Caustic Potash—

France,	21 pks.	F. W. Berk & Co.

Copper Sulphate—

Germany,	£55.	C. J. Capes & Co.

Cream of Tartar—

France,	5 pks	W. C. Bacon & Co.
Holland,	10	Middleton & Co.
,,	15	,,

Caoutchouc—

Barbadoes,	40 c.	R. M. S. P. Co.
Singapore,	15	R. & J. Henderson
Zanzibar,	10	L. & I. D. Jt. Co.
Mauritius,	90	,,
Jamaica,	20	,,
Germany,	4	Lewis & Peat
Colon,	20	Hoare, Wilson & Co.
E. Indies,	151	Ross & Deering
,,	33	Matheson & Co
France,	114	Beresford & Co.

Caustic Soda—

Holland,	460 c.	Beresford & Co.

Chemicals *(otherwise undescribed)*

Holland,	9 pks.	Williams, Torrey, & Co.
France,	6	Spies Bros. & Co.
Germany,	180	T. H. Lee

Chemicals *(continued).*

Germany,	738pks.	A. & M. Zimmermann
,,	8	Krutzfeldt
,,	25	Petri Bros.
,,	587	A. & H. Greeff
,,	48	T. H. Lee
Holland,	10	Phillipps & Graves
,,	12	L. Lumley & Co.
,,	7	W. Bomer & Co.
Germany,	6	T. H. Lee
,,	22	Phillipps & Graves

Dyestuffs—

Cutch

E. Indies,	52 pks.	Prop. Sun's Wf.

Argols

Cape Town,	32 pks.	Hale & Son

Anthracene

Holland,	37 pks.	Burt Boulton, & Co.

Sandal

E. Indies,	11 t.	Walker, Munsie, & Co.
,,	5	L & I. D. Jt. Co.

Tanners' Bark

Melbourne,	35 t.	Elkan & Co.
,,	32	Baxter & Hoare
,,	26	Hicks. Nash, & Co.
U. S.,	30	H. Kohnstann

Redwood

E. Indies,	20 t.	Benchendorff & Co.

Indigo

E. Indies,	2 chts.	L. & I. D. Jt. Co.
,,	18	,,
,,	8	W. Brandt, Sons & Co.
,,	4	Parsons & Keith
,,	21	F. Stahlschmidt & Co.
,,	20	
,,	2	L. & I. D. Jt. Co.
,,	9	Parsons & Keith

Sumac

Italy,	600 pks.	J. Kitchin, Ltd.
,,	100	Hicks, Nash, & Co.
,,	200	F. Roberts
,,	50	E. Austin & Co.
,,	750	W. Schelcott
,,	1,000	Brown & Elmslie
,,	900	Union Lighterage Co., Ltd.
,,	500	Beresford & Co.

Orchella

Portugal,	38 pks.	N. Smith

Madders

Holland,	2 pks.	J. R. Gray

Gambier

Singapore,	214 pks.	Ashmore & Son
,,	513	R. & J. Henderson
,,	128	W. H. Cole & Co.
,,	388	L. & I. D. Jt. Co.

Naphthaline

Germany,	41 pks.	Flemings Oil, & Chem. Co., Ltd.

Cochineal

Las Palmas,	25 pks.	Bullara, King, & Co.
Teneriffe,	20	F. Huth & Co.
Canaries,	21	J. Owen
,,	16	W. M Smith & Sons
,,	14	Kuhner, Henderson, & Co.
,,	16	Johnson, Rolls, & Co.

Extracts

Denmark,	2 pks.	Bailey & Leetham
Belgium,	20	Leach & Co.
Halifax,	280	A. J. Humphrey
Austria,	300	,,
Holland,	32	J. Forsey
France,	230	L. J. Levinstein & Sons
U. States,	260	Williams, Torry, & Co.

Glucose—

Germany,	15 pks.	118 c. Seaward Bros.
France,	100	100 ,,
,,	120	120 Barrett, Tagant, & Co.
,,	100	100 Both. & Nichs. Whvs. Co.
Holland.	20	50 J. Barber & Co.
U. S.,	50	300 L. Sutro & Co.
Holland,	5	42 T. M. Duche & Sons
Germany,	20	115 H. J. Litchfield & Co.
,,	100	100 ,,
,,	200	415 R. G. Hall & Co.
,,	20	166 J. Knill & Co.
,,	200	200 J. Barber & Co.
,,	200	200 T. H. Lee
,,	600	600 Tries, Meyer, & Co.
,,	400	600 C. H. Thomas
,,	50	50 Barrett, Tagant, & Co
U. S,	400	400 ,, ,,
,,	500	500 Humphrey & Co.
France,	100	100 C. & H. Nichols

Gutta Percha—

Batavia,	34 c.	L. & I. D. Jt. Co.
Singapore,	19	Kleinwort, Sons & Co.

Glycerine—

Germany,	32 pks.	A. & H. Grieff
,,	155	Beresford & Co.
Holland,	360	Spies, Bros. & Co.
New Zealand,	£98	Beresford & Co.
N. Russia,	145	Leach & Co.
Germany,	225	H. Lambert

Isinglass—

Singapore,	8 pks.	W. M. Smith & Sons
E. Indies,	15	Hale & Son
N. Russia,	6	M. D. Co.
Colon,	1	L. & I D. Jt. Co.
U. S.	44	W. M. Smith & Sons

Manganese Ore—

S. Russia,	400 t.	H. Bomer & Co.

Manure—

Germany,	50	F. W. Berk & Co.
,,	200	Lawes Manure Co. Ltd.
,,	158	C. Bauermeister
U. S.,	70	C. C. Bryden & Co.

Phosphate Rock

U. S.	1,452 t.	Wyllie & Gordon

Nitre—

Peru,	9,915 bgs.	W. Montgomery & Co.
Germany,	9 cks.	Craven & Co.

Naphtha—

Belgium,	2 drs.	Lister & Biggs
Germany,	9 brls.	Stein Bros.

Plumbago—

E. Indies,	118 cks.	G. G. Hall & Co.
,,	136	Doulton & Co.
,,	118	L. & I. D. Jt. Co.
Holland,	37	Brown & Elmslie
E. Indies,	183	Hoare, Wilson & Co.
Italy,	10 bgs.	B. Galloway
E. Indies,	596 brls.	J. Thredder, Son & Co.

Pitch—

U. S.	80 brls.	W. Isted
Spain,	10	J. Knill & Co.
France,	100	C. B. Leighton

Paraffin Wax—

U. S.,	100 brls.	H. Hill & Sons
,,	96	E. & H. Holdsworth
,,	100	G. H. Frank
,,	196	Mordaunt Bros.
,,	200	Rose, Wilson, & Co.
,,	70	G. H. Frank
,,	101	H. Hill & Sons
E. Indies,	244 cs.	,, ,,

Potassium Carbonate—

France,	17 cks.	C. J. Capes & Co.

Potassium Muriate—

Germany,	20 pks.	Pillow, Jones, & Co.

Phosphoric Acid -

Germany,	25 pks.	Phillipps, & Graves
,,	20	,, ,,

Potassium Bicarbonate—

Holland,	£60	A. & M. Zimmermann

Potassium Prussiate—

Germany,	5 pks.	B. & N. Whvs. Co., Ltd.
Holland,	6	A. & M. Zimmermann
Germany,	203	Bessler & Co.

Potassium Sulphate—

Germany,	508 pks.	Ang. Cntntl. G. Wks.
,,	£170	H. Lambert

Potashes—

Montreal,	84 c.	S. Ward & Co.

Stearine—

Holland,	49 bgs.	H. Hill & Son
Belgium,	113	,, ,,

Saltpetre—

Germany,	60 cks.	J. Hall & Son
,,	94 brls.	P. Hecker & Co.
,,	80 kgs.	,, ,,
Belgium,	500	Ang. Contntl. G. Wks.
U. S.	9 cks.	Craven & Co.
Germany,	8	P. Hecker & Co.

Sodium Acetate—

France,	£40	Prop. Hay's Wf.

Tar—

N. Russia,	1,881 brls.	W. F. Malcolm & Co.

Tartars—

Italy,	£1,180	Howards & Son

Tartaric Acid—

Holland,	6 pks.	B. & F. Wf. Co.
,,	8	W. C. Bacon & Co.
,,	2	F. W. Heilgers & Co.

Ultramarine—
Holland, 22 pks. Haeffner, Hilpert
" 2 cks. Ohlenschlager Bros.
Belgium, 9 cs. W. Harrison & Co.
Germany, 20 cks. H. Lambert
Verdigris—
France, £35 C. Brumlen
Zinc Oxide—
Holland, 215 brls. M. Ashby, Ld.
Germany, 2 cks. Girard, Frs. & Co.
Holland, 200 M. Ashby, Ltd.
U. S., 100 "

LIVERPOOL.

Week ending Nov. 4th.

Acetic Acid—
Rouen, 2 cks. R. J. Francis & Co.
Rotterdam, 6 bskts
Acids *(otherwise undescribed)*—
Rouen, 1 brls. R. J. Francis & Co.
Bone Ash—
Rosario, 157 bgs.
Pelotas, 14 qts.
Barytes—
Antwerp, 20 bgs. 22 cks.
Bones—
Valparaiso, 1,341 bgs. Jones and Roberts
Parnahiba, 15 c. R. Singlehurst & Co.
Bone Meal—
Calcutta, 2,999 bgs.
Cream of Tartar—
Patras, 7 brls.
Caoutchouc—
Lagos, 5 brls. Lane & Co.
" 10 Rayner & Co.
" 8 J. P. Werner & Co.
Cape Coast, 1 Challenor & Co.
" 3 Mordaunt Bros
" 1 cs. 2 Ibbers & Bell
" 1 2 Radcliffe & Durant
" 1 N. P. Nathan & Son
" 2 Davies, Robbins & Co.
" 6 L. Hart & Co.
" 2 F. & A. Swanzy
" 3 C. L. Clare & Co.
" 1 A. Myercough
" 10 Hawes & Co.
" 5 A. Millerson & Co.
" 3 W. Duff & Co.
" 3 W. D. Woodin
" 14 W. B. McIver & Co.
" 1 cs. 2 W. Symmington & Co.
" 1 Kinloch & Campbell
" 93 A. Miller, Bros. & Co.
" 6 19
Axim, 6 Edwards Bros.
" 4 Pickering & Berthoud
Assinee, 1 1 M. Ridyard
" 1 A. Verdier
" 2 Radcliffe & Durant
" 5 Pickering & Berthoud
" 1 1 A. Reis
" 2 Edwards Bros.
" 1 Ellis & Co.
" 1 L. Hart & Co.
" 3 5 Millward, B., & Co.
" 1 1 Waite & Co.
" 1 J. Schæffer
Chama, 3 J. Menben
Poassie, 1
Gr. Bassam, 10 cks. F. & A. Swanzy
" 9 E. Bennett & Co.
Sierra Leone, 3 8 bgs. N. Waterhouse & Sons
" 13 pns. Broadhurst, Son & Co.
" 42 brls. Pickering & Berthoud

Caoutchouc—*continued.*
Bahia, 73 bgs.
Pernambuco, 28 brls. Powell & Sing
Parnahiba, 3 cs. R. Singlehurst & Co.
Copper Regulus—
Caldera, 758 sks.
Copper Ore—
Caldera, 70 sks.
Caustic Potash—
Rotterdam, 2 dms.
Chemicals *(otherwise undescribed)*
Rouen, 43 cks. R. J. Francis & Co.
Rouen, 50 cks. Co-op. W'sale Society
Dyestuffs—
Myrabolams
Bombay, 146 bls.
Extracts
New York, 5 brls.
Havre, 6 cks. Cunard S.S. Co. Ld.
Valonia
Patras, 258 bgs. F. Huth & Co.
Argols
Bordeaux, 39 cks.
Oporto, 23 F. Leyland & Co.
Oporto, 23 German Bank of London
Fustic
Jamaica, 54 t.
Savanilla, 1,885 pgs. G. H. Muller & Co.
Vera Cruz, 1,120 lgs Bourne, Graham & Co.
Patras, 2 t.
Annatto
Bordeaux, 10 cks.
Logwood
Jamaica, 338 t.
" 152
Laguora, 100 Skelton & Schofield
Saffron
Valencia, 1 cs.
Orchella—
Lisbon, 15 bls. Barboza & Co.
Glycerine—
Rouen, 9 pks. R. J. Francis & Co.
Glucose—
Boston, 100 brls. A. D. M'Kay
Horn Piths—
Rosario, 20 t.
Santa Elena, 4,190 Kleinwort Sons & Co.
Pelotas, 7,500
Iron Oxide—
Trieste, 27 brls.
Manganese—
Bordeaux, 2 cks.
Manganese Ore—
Carrizal, 1,000 t.
Poti, 1,650 J. Birch & Co.
Naphtha—
New York, 2,892 brls.
Oxalic Acid—
Rotterdam, 10 crbys. O. & H. Marcus
" 12
Phosphate—
Montreal, 100 t. A. Hunter & Co.
Ghent, 600 bgs.
Montreal, 100 Millar & Co.
Potash—
Rouen, 17 cks. 21 dms. Co-op. W'sale Society Ld.
Pitch—
Rouen, 50 cks. Co-op. W'sale Society
Potash Salts—
Hamburg, 610 bgs.
Pyrites—
Huelva, 1,426 t. Matheson & Co.
" 1,538 Matheson & Co.
" 1,120 Matheson & Co.
Soap—
Boston, 2 cs. J. Thompson
Bari, 83
Saltpetre—
Antwerp, 1 bg. J. T. Fletcher & Co.
Calcutta, 563 Ralli Bros.
Stearine—
Rotterdam, 20 bgs.
Sodium Nitrate—
Iquique, 3,861 bgs.

Salt—
Curacao, 300 bgs. T. F. Brough & Co.
Tartaric Acid—
Rotterdam, 12 cks.
Ultramarine—
Rotterdam, 5 cs. 2 cks.
Verdigris—
Bordeaux, 7 cks.
Waste Salt—
Hamburg, 110 t.
" 110 508 bgs.
Zinc Oxide—
Terneuzen, 63 cks. J. T. Fletcher & Co.
" 325
Rotterdam, 75 cks.
Antwerp, 10 brls. J. T. Fletcher & Co.
" 30

HULL.

Week ending November 6th.

Barytes—
Antwerp, 20 cks. H. F. Pudsey
Bremen, 20 J. Pyefinch & Co.
" 61
Carbonic Acid—
Rotterdam, 2 bttls. G. Lawson & Sons
Chemicals *(otherwise undescribed)*
Antwerp, 215 pks. Wilson Sons & Co.
Hamburg, 207 4 cks. "
Dunkirk, 21
Bremen, 2 cs. 4 Veltmann & Co.
Dyestuffs—
Madders
Rotterdam, 3 cks. W. & C. L. Ringrose
Alizarine
Rotterdam, 9 pks. W. & C. L. Ringrose
" 9 cks. Hutchinson & Son
" 57 pks. W. & C. L. Ringrose
" 19 cks. 6 kgs. 1 cs. W. & C. L. Ringrose
" 116 pks. Hutchinson & Son
Sumac
Trieste, 180 bgs. Wilson Sons & Co.
Palermo, 742 pks. "
" 50 bgs.
Logwood
Hamburg, 80 bgs. Wilson Sons & Co.
Dyestuffs *(otherwise undescribed)*
Hamburg, 1 cs. C. M. Lofthouse & Co.
Glucose—
New York, 50 brls.
Danzig, 24 cks.
Rotterdam, 300 bgs. Wilson Sons & Co.
Stettin, 200 "
" 1,200 C. M. Lofthouse & Co.
Hamburg, 35 cks. Woodhouse & Co.
" 10 Rawson & Robinson
Glycerine—
Rotterdam, 20 crbys. W. & C. L. Ringrose
Litharge—
Rotterdam, 60 cks. G. Lawson & Sons
Phosphate—
Montreal, 2,422 bgs. 120 t.
Pitch—
Antwerp, 10 cks. H. F. Pudsey
" 38
Plumbago—
Hamburg, 64 cks. Wilson Sons & Co.
Saltpetre—
Hamburg, 10 cks. Bailey & Leetham
" 2
Stearine—
Rotterdam, 53 bls. W. & C. L. Ringrose
Sulphur—
Catania, 1,669 pks. Wilson Sons & Co.
" 270
Girgenti, 2,000 bgs. "
Soda—
Hamburg, 19 cks. C. M. Lofthouse & Co.
Rotterdam, 8 G. Lawson & Sons
Turpentine—
Hamburg, 3 cks. Wilson Sons & Co.
Ultramarine—
Rotterdam, 9 pks. Sissons Bros. & Co.
Waste Salt—
Hamburg, 700 bgs. Wilson Sons & Co.

TYNE.

Week ending November 5th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.
Acetic Acid—
Rotterdam, 10 cks. Tyne S. S. Co.
Barytes—
Rotterdam, 46 cks. Tyne S. S. Co.
Copper Precipitate—
Pomaron, 3,343 bgs. Mason & Barry
" 3 cs.
Glucose—
Rotterdam, 50 bgs. Tyne S. S. Co.
" 90 "
Lead Sulphate—
Stavanger, 194 cks.
Manure—
Phosphate Rock
Beaufort, 800 t. G. & W. S. Burrell
" 1,779 Langdale's Manure Co.
Precipitate—
Huelva, 11,411 bgs. Rio Tinto Co.
Sulphur Ore—
Pomaron, 1,050 t. Mason & Barry
Saltpetre—
Hamburg, 8 cks. Tyne S. S. Co.
Sodium Silicate—
Rotterdam, 10 cs. Tyne S. S. Co.
Ultramarine—
Rotterdam, 20 cs. Tyne S. S. Co.
" 2 cks. "

GRIMSBY.

Week ending November 1st.

Albumen—
Dieppe, 10 cs.
Chemicals *(otherwise undescribed)*
Hamburg, 3 pks.
Glucose—
Hamburg, 10 pks.
" 22 cks.
Zinc Ashes—
Antwerp, 19 cks.

GOOLE.

Week ending Oct. 29th.

Acetate of Chrome—
Rotterdam, 10 cks.
Chrome Oxide—
Rotterdam 2 cks.
Caoutchouc—
Boulogne, 1 cs. 5 cks.
Dyestuffs—
Logwood
Rotterdam, 1,600 pcs.
Madders
Rotterdam, 1 ck.
Rouen, 1
Alizarine
Rotterdam, 54 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 49 cks. 10 cs.
Glucose—
Dunkirk, 400 bgs.
Muriate—
Rotterdam, 9 cks.
Potash—
Calais, 62 dms.
Dunkirk, 47 cks.
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 32 cks.
Ultramarine—
Rotterdam, 6 cs.
Waste Salt—
Hamburg, 2,158 bgs. 750 t.
" 102

GLASGOW.

Week ending November 6th.

Alum—
Rotterdam, 4 cks. J. Rankine & Son
Barytes—
Antwerp, 290 bgs
Rotterdam, 114 cks.
Cream of Tartar—
Marseilles, 10 cks.
" 11
Charcoal—
Antwerp, 256 bgs. Clyde Shipping Co.
Chemicals *(otherwise undescribed)*
Hamburg, 3 cs.

Dyestuffs—
Extracts
Antwerp, 4 cks. 1 cs.
Alizarine
Rotterdam, 231 cks. 1 cs. J. Rankine & Son
" 3 cs.
" 23 cks.
Madders
Bordeaux, 4 cs. J. & P. Hutchison
Marseilles, 14 cks. Jackson Bros.
" 10 J. Pattison & Co.
" 6 Robertson, M'Intosh & Co.
Rotterdam, 4 J. Rankine & Son

Indigo
Rotterdam, 6 chts. J. Rankine & Son
Annatto
Bordeaux, 3 cs. J. & P. Hutchison
Dyestuffs *(otherwise undescribed)*
Antwerp, 8 pks.
Glycerine—
Hamburg, 20 drms.
Rotterdam, 4 cs. 6 balls.
Litharge—
Hamburg, 4 cks.
Nickel Ore—
Tchio, 1,401 t. The Nickel Co.
Pitch—
Marseilles, 133 cks.

Potassium Bichromate—
Rotterdam, 5 cks. J. Rankine & Son
Pyrites—
Huelva, 168 t. Tharsis Co.
Potassium Carbonate—
Hamburg, 22 cks.
Saltpetre—
Hamburg, 120 kgs.
" 20 cks.
Soap—
Marseilles, 6 cs. Alexander & Aikman
" 70
" 5 85 bxs.
New York, 1 2

Sodium Bichromate—
Rotterdam, 10 cks. J. Rankine & Son
Tartar—
Bordeaux, 6 cks.
Ultramarine—
Antwerp, 24 cs.
Waste Salt—
Hamburg, 2,002 bgs.
" 508
" 1,990
Zinc Oxide—
New York, 50 brls.
Antwerp, 53
" 50

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending October 29th.

Acetic Acid—
Canterbury, 15 cs. £27
Cape Town, 15 30
Ammonia—
B. Ayres, 25 cs. £47
Arsenic—
St. Petersburg, 10 t. 2 c. £162
Ammonium Muriate—
Sydney, 6 t. 2 c. £140
Ammonium Carbonate—
Hamburg, 18 pks. £32
Bremen, 59 220
St. Petersburg, 10 c. 19
Danzig, 1 t. 13 45
Paris, 2 14 82
Alum Cake—
Calcutta, 27 t. 3 c. £100
Acid *(otherwise undescribed)*—
Cologne, 200 btls. £320
Mauritius, 4 crbys. 17
Ammonium Sulphate—
Hamburg, 609 c. £375
Canaria, 2 t. 26
Demerara, 5 6 66
Berbice, 20 6 250
Dusseldorf, 5 59
Demerara, 50 5 623
Las Palmas, 25 321
Ghent, 28 10 328
Dunkirk, 5 57
Bisulphide of Carbon—
Monte Video, 12 cs. £16
Bones—
Boulogne, 15 t. 19 c. £148
Las Palmas, 20 92
Treport, 23 1 199
Borate of Manganese—
Stockholm, 4 c. £11
Borax—
Valparaiso, 13 pks. £45
Madras, 14 c. 23
Sydney, 43 64
Melbourne, 20 32
Dusseldorf, 10 cs. 39
Rotterdam, 5 14
Hamburg, 18 52
Melbourne, 90 225
Calcined Chloride—
Yokohama, 28 drs. £33
Charcoal—
Dunkirk, 30 t. 12 c. £130
Hamburg, 10 4 45
Rotterdam, 30 11 127
Caustic Potash—
Melbourne, 4 t. £91
Hong Kong, 5 c. 12
Citric Acid—
St. Petersburg, 16 c. £121
Algoa Bay, 2 24
St. Petersburg, 10 kgs. 70
Hamburg, 3 cks. 105
Rotterdam, 5 36
Seville, 4 28
St. Petersburg, 40 298
Natal, 2 17
Cobalt Oxide—
Boulogne, 3 c. £145
Hamburg 2 94
Copperas—
Bussorah, 50 brls.
Canary, 6 c. £23 15

Cream of Tartar—
Canterbury, 10 c. £55
Cooktown, 2 11
Melbourne, 2 t. 210
Townsville, 5 cs. 28
Melbourne, 20 111
Wellington, 14 pks. 108
Copper Sulphate—
Adelaide, 10 t. £194
Melbourne, 5 93
Riga, 3 59
Madras, 10 c. 14
Genoa, 10 190
Caustic Soda—
Batoum, 131 t. 2 c. £1,640
Brisbane, 5 5 67
Algoa Bay, 16 45
" 22 36
E. London, 6 9
Lisbon, 6 70
Pt. Natal, 34 53
Algoa Bay, 11 16
Calcutta, 3 7 39
E. London, 11 18
Carbolic Acid—
Bordeaux, 18 tubes £40
Philadelphia, 11 c. 126
Melbourne, 2 16
Dusseldorf, 109 cks. 3,473
Hong Kong, 3 18
Antwerp, 121 667
B. Ayres, 2 cs. 12
Coal Products—
Pitch
Antwerp, 135 t. £206
Calcutta, 10 16 c. 28
Antwerp, 129 197
" 144 220
Gijon, 420 599
Antwerp, 5 8 83
Catania, 2 10 12
Antwerp, 255 447
New York, 2 32
Duisbury, 125 209
Bordeaux, 500 700
Antwerp, 245 398
Benzole
Rotterdam, 65 drs. £1,171
" 8 188
Antwerp, 1 ck. 21
Rotterdam, 18 381
" 20 pns. 400
" 10 cks. 205
" 60 pns. 53 1,523
Anthracene
Rotterdam, 114 £840
Dusseldorf, 57 432
" 252 2,335
Rotterdam, 135 800
" 78 435
" 252 2,547
Alizarine
Boston, 80 c. £338
Philadelphia, 3 t. 19 340
Genoa, 8 36
Napthaline
Stettin, 193 c. £89
Hamburg, 32 cks. 40
Le Treport, 8 18
Hamburg, 286 bgs. 70
Rotterdam, 286 70
Tar
Calcutta, 200 rults. £160
Melbourne, 100 drs. 19
Rio de Janeiro, 120 61
Natal, 25 cks. 19
Norrkoping, 40 brls. 25
Hong Kong, 30 32
Rio de Janeiro, 20 24
Hong Kong, 20 23
Leghorn, 275 130
Calcutta, 25 19

Creosote
Bordeaux, 964 cks. £723
Stettin, 6 c. 300
Naphtha
Calais, 12 c. £18
Chemicals *(otherwise undescribed)*
Madras, 5 cs. £14
Calcutta, 13 c. 34
Adelaide, 6 18
Natal. 3 19
Sydney, 40 pks. 72
Bombay, 1 70
" 12 24
Kurrachee, 8 22
Madras, 1 12
Melbourne, 2 17
" 10 18
E. London, 2 17
Dunedin, 6 pks. 30
Cairns, 10 c. 27
Melbourne, 1 13
Algoa Bay, 4 cs. 9
" 48 pks. 55
Stockholm, 3 cks. 37
Dried Blood—
Las Palmas, 15 t. 15 c. £173
Canaria, 2 t. £16
Disinfectants—
Melbourne, 50 cks. £68
Sydney, 4 40
St Petersburg. 2 t. 10 c. 35
Melbourne, 156 pks. 72
Madras, 120 drs. 45
Singapore, 200 45
Guano—
Berbice, 20 t. 12 c. £217
Demerara, 5 9 57
Genoa, 25 250
Glycerine—
Hamburg, 199 c. £220
Rouen, 14 t. 4 341
New York, 5 38
Colombo, 3 11
Hiogo, 40 cs. 107
Hypophosphate of Lime—
Philadelphia, 3,120 lbs. £213
" 10 c. 118
Hypophosphate of Quinine—
Philadelphia, 9½ lbs. £13
Hydro Carbon—
Brussels, 115 c. £56
Insect Powder—
Rio Grande, 2 c. £16
Natal, 2 cs. 36
Sydney, 22 91
Natal, 5 11
Algoa Bay, 1 11
Muriatic Acid—
Bombay, 10 pks. £16
Madras, 6 c. 10
Manure—
Barbadoes, 21 t. 4 c. £191
Orotava, 7 10 69
Bordeaux, 35 255
Inverreargill, 3 27
Philadelphia, 1 17
Morant Bay, 6 532
Hamburg, 2 10 22
Rochefort, 155 815
Gandia, 580 6 4,877
Denia, 400 3,200
Valencia, 178 4 1,424
Rouen, 8 40
Bordeaux, 25 120
Lisbon, 5 18 31
Barbadoes, 50 425
Nitric Acid—
Melbourne, 20 cs. £28

Potassium Iodide—
Melbourne, 1 c. £61
Pyridine Bases—
Cologne, 85 c. £110
Potash Crystals—
Montreal, 8 c. £25
Toronto, 16 30
Phosphorus—
Melbourne, 23 cs. £157
Shanghai, 3 24
Potassium Chlorate—
Melbourne, 1 t. £47
Gothenburg, 5 c. 11
Calcutta, 10 25
Potassium Sulphate—
Barbadoes, 97 t. 7 c. £1,021
Potassium Permanganate—
Melbourne, 5 c. £15
Potash—
Madras, 6 cs. £30
Phosphate—
Treport, 30 t. £225
Quinine Sulphate—
Melbourne, 1 cs. £26
Salammoniac—
Madras, 2 t. 10 c. £95
Trebizonde, 12 25
Seville, 8 15
Sulphur—
Wellintgon, 5 t. £35
E. London, 2 9 c. 25
Saltpetre—
Santos, 20 cks. £20
Halifax, 2 c. 25
Rio de Janeiro, 90 101
Flushing, 11 10
Melbourne, 10 11
" 26 27
Dunedin, 20 22
E. London, 20 21
Seville, 51 53
M. Video, 20 30
Sydney, 21 21
Savanilla, 5 t. 3 111
Sulphuric Acid—
Aden, 10 cs. £10
Algoa Bay, 30 c. 14
Natal, 7 t. 3 259
Aden, 15 11
Soda Salts—
New York, 52 c. £25
" 2 t. 25
Sheep Dip—
Falkland Isles, 170 cks. £1,052
" 19 62
E. London, 4 t. 10 c. 110
Algoa Bay, 150 drs. 30
" 50 cs. 140
E. London, 25 62
" 10 27
Algoa Bay, 8 46
Natal, 51 105
Napier, 2 t. 19 48
Calcutta, 50 drs. 30
Port Natal, 100 cs. 280
" 101 280
Algoa Bay, 2 t. 112
Pt. Elizabeth, 120 pks. 86
E. London, 101 25
Sulphur Flowers—
E. London. 100 kgs. £50
Melbourne. 16 c. 20
Algoa Bay, 22 14
" 2 t. 5

Sodium Bicarbonate—
St. Petersburg, 22 c. £28
Superphosphate of Lime—
Canaria, 1 t. £5
Superphosphate—
Canaria, 1 t. £5
La Rochelle, 150 450
Sodium Suphate—
Ghent, 70 t. £70
Soap Lye—
Rotterdam, 238 t. £162
Tartaric Acid—
Townsville, 2 cs. £15
Sydney, 5 kgs. 35
" 20 135
Bombay, 1 ck. 8
Melbourne, 25 c. 171
Wellington, 12 pks. 103
Natal, 2 c. 15

LIVERPOOL.

Week ending Nov. 1st.

Alkali—
Barcelona, 9 cks.
Boston, 73 tcs.
Leghorn, 51 5 brls.
Acetic Acid—
Vera Cruz, 1 t. 3 c. 1 q. £19
Albumen—
Santos, 5 c. 1 q. £23
Vera Cruz, 4 13
Ammonium Muriate—
Montreal, 6 c. £8
Philadelphia, 4 t. 6 3 q. 117
Genoa, 2 1 3 33
Philadelphia, 6 11 141
New York, 5 5 130
Antwerp, 7 1 8
Boston, 3 14 92
Antimony Regulus—
New York, 19 t. 17 c. £997
Amsterdam, 3 1 213
" 10 1 730
Rotterdam, 5 3 360
New York, 5 365
Ammonium Carbonate—
Montreal, 1 t. 2 q. £34
Hamburg, 1 4 c. 2 40
Odessa, 2 1 1 67
Bilbao, 1 3 34
Lisbon, 15 31
B. Ayres, 1 42
Ammonia—
Ensenada, 1 t. £8
Alum—
Valencia, 1 t. 9 c. 3 q. £7
Penang, 5 1 26
Piræus, 2 10 13
Syra, 3 10 18
Alexandretta, 2 18 2 14
Constantinople, 9 6 47
Galatz, 2 19 15
Ibrail, 1 18 9
New York, 16 9 3 187
Beyrout, 6 3 35
" 2 18 14
Melbourne, 2 14 14
Syra, 5 6 27
Vera Cruz, 11 1 7
Seville, 14 7 72
Philadelphia, 5 9 16
Ammonium Sulphate—
Valencia, 101 t. 2 c. 3 q. £1,205
Bordeaux, 15 6 2 174
Malaga, 50 15 1 564
New York, 25 2 302
Rouen, 15 4 150
Valencia, 60 10 658
Bordeaux, 4 18 1 45
Teneriffe, 2 19 1 36
Barcelona, 10 5 114
Arsenic Acid—
New York, 13 t. £270
Bleaching Powder—
Antwerp, 56 cks
Barcelona, 50
Boston, 619 59 tcs.
Genoa, 95
Havre, 25
Montreal, 146 340
New York, 398
Odessa, 13
Palermo, 10
Rouen, 48
Antwerp, 3
Boston, 52
Ghent, 130
New York, 489 275 brls.

Bleaching Powder—*continued.*
Odessa, 5
Philadelphia, 50
Rotterdam, 25
San Francisco, 60
Terneuzen, 25
Trieste, 63
Boracic Acid—
Montreal, 2 t. 7 c. 2 q. £71
Copenhagen, 1 6 2 50
Borax—
Batoum, 16 c. £32
Ibrail, 15 3 q. 24
Antwerp, 5 t. 3 142
Hamburg, 4 8 123
Rouen, 14 7 554
Montreal, 5 16 135
Odessa, 1 3 2 32
Havana, 5 7
Melbourne, 1 5 3 33
Brimstone—
Para, 11 c. 3 q. £5
Rouen, 15 t. 68
Calcutta, 16 1 1 82
Madras, 10 17 3 57
Amsterdam, 50 2 2 245
Caustic Soda—
Adelaide, 60 dms.
Amsterdam, 20
Baltimore, 200
Barcelona, 150
Bari, 43
Bilbao, 25
Bolivar, 10
Boston, 200
Braila, 62
B. Ayres, 25 brls.
Calcutta, 88
Callao, 25 25 kgs.
Cape Town, 6
Chicago, 50
Danzig, 2
Galatz, 205 60
Geelong, 15
Hamburg, 20
Havre, 9
Helsingborg, 18
Ibrail, 88
Lisbon, 10
Maranham, 5
Melbourne, 36
Montreal, 513 20 cks.
New York, 945
Odessa, 150
Oporto, 20
Philadelphia, 50 135
St. Petersburg, 1,100 drms.
San Francisco, 100
Santos, 20
Savanilla, 20 50 kgs.
Seville, 825
Sydney, 15
Tampico, 50
Vera Cruz, 100
Vigo, 5
Ancona, 10
Antwerp, 7
Bahia, 20
Barcelona, 120 brls.
Bari, 72
Bilbao, 50
Bordeaux, 7
Calcutta, 50 cks.
Callao, 30
Catania, 30
Galatz, 15
Genoa, 57
Hamburg, 3 5
Hiogo, 100
La Guayra, 12
Malta, 40 tins.
Messina, 40 17 coils.
Naples, 80
New York, 859
Philadelphia, 100
Piræus, 10
St. Petersburg, 310
San Francisco, 100
San Sebastian, 100 20 brls.
Santander, 48
Seville, 146
Trieste, 6
Calcium Chloride—
Antwerp, 5 t. £13
Charcoal—
Hamburg, 51 t. £255
Rouen, 150 43
Carbolic Acid—
Rotterdam, 4 c. £16
St. Thomas, 5 cks. 24
Antwerp, 2 2 q. 8
Genoa, 1 3 12
Singapore, 5 7
Montreal, 10 1 35
Havana, 3 2
New York, 2 t. 1 152 9

Cobalt Oxide—
Valencia, 1 c. £55
Copperas—
Piræus, 2 t. 12 c. £6
San Francisco, 48 98
Copper Sulphate—
Tarragona, 8 t. 11 c. 1 q. £160
Galatz, 2 39
Ghent, 1 9 2 32
Constantinople, 12 10
La Union, 10 177
Montreal, 5 17 2 95
Genoa, 2 10 45
Adelaide, 22 10 622
Gothenburg, 1 2 20
Antwerp, 6 3 2 111
Libau, 1 1 18
Rotterdam, 9 2 1 92
Stockholm, 2 9 42
Palermo, 3 2 53
Venice, 10 5 175
Catania, 13 3 16
Bombay, 5 109
Rouen, 5 12 122
Constantinople, 3 5 60
Melbourne, 17 10 375
Hamburg, 2 12 2 47
Leghorn, 10 6 185
Genoa, 83 16 3 1,563
Iquique, 40 1 3 711
Ancona, 45 5 812
Barcelona, 5 1 1 91
Bombay, 5 88
Bordeaux, 12 2 2 240
San Sebastian, 15 290
Sydney, 1 5 26
Rouen, 89 16 1,751
Mazatlan, 27 13 541
Santos, 9 3 14
Madras, 5 5
Hamburg, 19 19 350
Iquique, 40 1 3 720
Citric Acid—
Havana, 2 c. £16
Caustic Potash—
Chicago, 1 t. 1 c. £21
London, Ont., 1 17 37
Stettin, 3 10 70
B. Ayres, 2 15 58
Chemicals *(otherwise undescribed)*
San Francisco, 1 t. 15 c. £25
Vera Cruz, 9 12 68
Disinfectants—
Rangoon, 1 t. £25
Epsom Salts—
Bombay, 150 kgs.
Rio de Janeiro, 50
Toronto, 40 brls.
Rio de Janeiro, 100
Glycerine—
Rotterdam, 4 t. 19 c. £100
" 15 1 318
Hamburg, 7 7 177
Guano—
Barcelona, 10 t. 4 c. 3 q. £101
Iron Oxide—
Gijon, 2 t. 3 c. £12
Lead Nitrate—
Vera Cruz, 6 c. 2 q. £8
Magnesium Chloride—
Rouen, 10 t. 8 c. £30
Bombay, 22 8 59
" 4 4 12
Manure—
Barbadoes, 30 t. £261
Oxalic Acid—
Montreal, 11 c. £19
New York, 7 t. 2 1 q. 125
" 5 6 3 125
Melbourne, 11 2 19
Potashes—
Catania, 3 t. 2 c. £62
Amsterdam, 3 3 73
Pitch—
Nantes, 188 t.
New York, 56
Potassium Chlorate
Stockholm, 10 t. £450
Montreal, 10 c. 24
New York, 15 675
B. Ayres, 4 11
San Francisco, 2 10 112
San Juan, 8 3 q. 23
St. Petersburg, 11 10 535
New York, 5 233
Hamburg, 15 32
Genoa, 2 97
Gothenburg, 33 1,447
New York, 5 244
Copenhagen, 10 26
Randers, 1 42
St. Petersburg, 10 473

Potassium Bichromate—
Ibrail, 11 c. £18
Rio de Janeiro, 6 10
Kobe, 3 t. 17 130
Santos, 16 3 q. 37
Venice, 4 19 165
Potassium Carbonate—
Santos, 13 c. 1 q. £15
Sheep Dip—
B. Ayres, 218 drs. £104
Soda Ash—
Ancona, 16 cks.
Baltimore, 67 75 tcs.
Beyrout, 15
Boston, 436 28 400 bgs.
Cadiz, 4
Constantinople, 250 brls.
Corfu, 19
Genoa, 24
Ghent, 8
New York, 57
Oporto, 10 25 4
Philadelphia, 137
Rotterdam, 47
Santos, 5
" 5
Smyrna, 800
Syra, 100
Leghorn, 51
Ancona, 4 chts.
Baltimore, 173 cks. 415
Barcelona, 145
Bombay, 6
Boston, 100 kgs. 112
B. Ayres, 54 cks. 125 570
Callao, 20 dms. 30
Colombo, 8
Galatz, 42
Ghent, 53 cks.
Melbourne, 26
Mexico City, 39
Montreal, 144
" 67
New York, 695 712 50
Philadelphia, 158 1,025
Piræus, 20
Rio Grande do Sul, 20
Rio de Janeiro, 40 200
Sherbrooke, 11
Smyrna, 25
Sydney, 269
Toronto, 450
Volo, 2
Windsor Mills, 90
Salt—
Antwerp, 21 t.
Baltimore, 350
Barbadoes, 16
Cabenda, 37½
Cameroons, 20
C. C. Castle, 6¼
Charlotte Town, 30
Chicago, 65
Ensenada, 196 9 c.
Gaboon, 50
Galveston, 675
Iceland, 45
Lagos, 230
Loango, 32 10
Manaos, 19 12
Manoh, 20
Marshand, 226
Melbourne, 150
Montreal, 250
New Orleans, 230
New York, 650
O. Calabar, 80
Opobo, 30
Para, 440¾
Port Natal, 50
Rotterdam, 200
San Francisco, 50
San Juan, 1
Sette Cama, 7½
Sierra Leone, 200
Sinoe, 10
Sulymah, 20
Trinidad, 12
Victoria, 100
Calcutta, 800
Montreal, 319
Adelaide, 2
Demerara, 36
Gibraltar, 2½
Halifax, 23 cs.
Monrovia, 35
New York, 5
Para, 53 14
Rangoon, 4, 170
Soap—
Axim, 12 bxs.
Barbadoes, 400
Boston, 1 cs.
Gibraltar, 385
Havre, 40
Malta, 50
Piræus, 1

Soap—*continued.*
New York, 113 bxs.
Philadelphia, 2 cks.
Rotterdam, 50 dms.
Trinidad, 1,000
Antwerp, 400
Assinee, 12
Barbadoes, 690
Calcutta, 1
Colon, 40
Copenhagen, 30
Curacao, 200
Demerara, 1,090
Ghent, 200
Grenada, 100
Hamburg, 150
Kingston, 728
Las Palmas, 1
Lisbon, 20
Madras, 100
Malta, 20
Manili, 1
Montreal, 100
Palma, 224
Rotterdam, 490
St. Ann's Bay, 50
Shanghai, 2,500
Smyrna, 1
Sulina, 298
New York, 1
Surmham, 298
Teneriffe, 175
Toronto, 300
Trinidad, 250
Bombay, 41

Sodium Bicarbonate—
Barcelona, 50 brls.
Hamburg, 181 kgs.
Barcelona, 110
Bombay, 700
B. Ayres, 20 cks.
Calcutta, 1,250
Genoa, 80
Hamilton, 250
Kingston, 50
Kurrachee, 250
London, Ont., 200
Marseilles, 12
Melbourne, 958
Montreal, 1,170
Naples, 30
Odessa, 400
Paris, 75
Quebec, 250
Riga, 615
San Francisco, 200
San Juan, 20
Santander, 40
Smyrna, 75
Stockholm, 20
Sydney, 200
Tangiers, 10
Toronto, 600 5

Soda Crystals—
Bilbao, 23 brls.
Boston, 420
Constantinople, 100
Ibrail, 10 drms.
Montreal, 334
New Orleans, 167
Valparaiso, 180
Bombay, 250 kgs.
Boston, 100 112 brls.
Calcutta, 30
Galatz, 10
Philadelphia, 560 cks.
St. Johns, 100
Smyrna, 50
Valparasio, 100

Sodium Carbonate—
Boston, 112 brls.
Lisbon, 31

Sodium Silicate—
Corunna, 17
Santander, 4
Tunis, 5
Volo, 5

Sodium Nitrate—

Shanghai,	5 t.	1 c.	3 q.	£45
West Point,	1		2	9
Malaga,	2	10	3	13

Stannous Chloride—

New York,	3 t.	2 c.	2 q.	£102

Saltpetre—

Valencia,		10 c.		£11
Para,		11	3 q.	£14
,,	7 t.	10		161
Havana,		10	2	16

Salammoniac—

Smyrna,		16 c.	1 q.	£28
Batoum,		3		6
Hamburg,		6		11
Ibrail,		3	3	5
Beyrout,		6	3	11
Marseilles,	2 t.	13	2	81

Salammoniac—*continued.*

San Francisco,		11 c.	1 q.	£20
Hamburg,		12	1	22
Constantinople,		3		10
Iquique,		15		33
Odessa,		19	1	33
Naples,	2 t.	2		71

Sodium Hyposulphate—
San Sebastian, 2 c. £6

Sodium Biborate—

New York,	11 t.	15 c.	2 q.	£425
Montreal,	3	11	3	108
Hamburg,	2	2		68
Amsterdam,	6	8	3	193
Hong Kong,	5	19		178

Sulphur—

Pernambuco,	1 t.	2 c.	3 q.	£8
Boston,	50	2		225
,,	25			109

Sulphuric Acid—

Rangoon,	4 t.	7 c.	2 q.	£56
Valparaiso,		19		11

Sugar of Lead—
Rio de Janeiro, 6 c. £8

Sodium Bichromate—
Genoa, 4 t. 2 c. £95

Sodium Chlorate—

Genoa,	5 c.	£16
Rotterdam,	5	16

Tar—
Monte Video, 11 drs.

Zinc Muriate—

Bombay,	5 t. 17 c.	£90

Zinc Chloride—
Bombay, 1 t. 5 c. £2 5

HULL.

Week ending November 4th.

Bleaching Powder—
Amsterdam, 10 cks.
Drontheim, 39

Bone Size—
Bremen, 20 cks.
Harlingen, 11
Ghent, 4

Borax—
Danzig, 5 cks.
St. Petersburg, 38

Benzole—
Hamburg, 11 drms.

Caustic Soda—
Abo, 10 drms.
Danzig, 119
Libau, 120
St. Petersburg, 325
Riga, 36
Wasa, 50

Chemicals *(otherwise undescribed)*

Antwerp,	4 cs.	20 pks.	
Amsterdam,			15 cks.
Boston,			50
Christiania,		16	90
Danzig,		30	29
Dunkirk,			38
Gothenburg,	15		
Hamburg,	137	106	26
New York,		200	45
St. Petersburg,		80	163
Rotterdam,	48	65	43
Stockholm,	4		
Stettin,	82	20	2
Wasa,		20	7

Dyestuffs *(otherwise undescribed)*

Antwerp,	4 cks.		
Christiania,	1	1 cs.	50 bgs.
Hamburg,	5	1	2 kgs.
Rotterdam,	7		
Riga,		1	
Rouen,	1		
Revel,		1	

Manure—
Hamburg, 952 bgs.
Rotterdam, 200

Soap—
Christiania, 75 cs.

Tar—
Ghent, 1 cs.
Hamburg, 13 cks.

GRIMSBY.

Week ending November 1st.

Chemicals *(otherwise undescribed)*
Dieppe, 21 cks.

Dyestuffs *(otherwise undescribed)*
Dieppe, 3 cks.

GOOLE.

Week ending Oct. 25th.

Alkali—
Boulogne, 10 cks.

Benzole—
Antwerp, 26 cks.
Dunkirk, 42
Hamburg, 12 drs.
Rotterdam, 142
Ghent, 8

Bleaching Preparations—
Ghent, 69 cks.

Coal Products—
Calais, 10 cks.
Ghent, 4 cs.

Chemicals *(otherwise undescribed)*
Hamburg, 8 cks.

Dyestuffs *(otherwise undescribed)*
Antwerp, 5 cks.
Boulogne, 1 cs. 7 10 drs.
Rotterdam, 2

Manure—
Ghent, 233 bgs.
Rotterdam, 225

Pitch—
Antwerp, 533 t,

TYNE.

Week ending November 5th.

Antimony—
Copenhagen, 10 c.

Alum Cake—
Copenhagen, 10 t. 10 c.

Alkali—

Antwerp,	3 t.	4 c.
Christiania,	1	4
,,	84	10
Riga,	6	6
Copenhagen,	3	1

Arsenic—
Copenhagen, 1 t. 11 c.

Alum—
Bilbao, 5 t. 8 c.

Barytes Carbonate—

Stettin,	62 t.	
,,	20	

Bleaching Powder—

Ghent,	66 t.	9 c.
Stettin,	8	3
,,	77	10
,,	72	14
,,	93	5
Gothenburg,	12	4
,,	2	17
Seville,	4	11
Antwerp,	51	14
,,	48	19
Gothenburg,	65	4
Odense,	11	2
Hamburg,	13	14
,,	19	18
,,	4	13
Christiania,	1	5
Aarhuus,	10	16
Esbjerg,	1	4
Riga,	30	4
Copenhagen,	10	
Libau,	35	3
,,	25	
San Francisco,	28	11

Copperas—
Esbjerg, 6 t. 6 c.

Caustic Soda—
Seville, 74 t. 8 c.
Riga, 29 17
Copenhagen, 10 3
San Francisco, 60

Epsom Salts—
Seville, 6 t.

Ferro Manganese—
Bilbao, 26 t. 4 c.

Litharge—
Copenhagen, 1 t. 2 c.

Magnesia—
Hamburg, 6 c.
Bilbao, 1 t. 8

Potassium Chlorate—
Copenhagen, 2 t. 8 c.

Pitch—
Stettin, 134 t. 7 c.
Copenhagen, 20

Potassium Bichromate—
Hamburg 7 c.

Sodium—
Hamburg, 1 cs.

Sodium Sulphate—
Riga, 24 t. 14 c.
Copenhagen, 3 t. 3 c.

Sodium Silicate—
Bilbao, 3 t. 7 c.

Soda—

Seville,	5 t.	7 c.
Aalborg,	29	19
Aarhuus,	9	19
Svendborg,	15	10
Odense,	8	11
New York,	200	12
Hamburg,	3	6
Christiania,	10	2
,,	2	16
Drontheim,	23	10

Soap—
Bergen, 10 c.

Sulphur—
Gothenburg, 20 t.

Soda Ash—

Gothenburg,	110 t.	
Hamburg,	19	8 c.
Christiania,	2	7
Stettin,	10	
Antwerp,	5	17
Aalborg,	6	
Riga,	15	7
Bergen,	2	9
Copenhagen,	50	14

Sodium Hyposulphite—
Riga, 10 t. 2 c.
Antwerp, 13

GLASGOW.

Week ending November 6th.

Ammonium Sulphate—
Rochefort, 15 t. 1¼ c. £175

Acid *(otherwise undescribed)*
Bombay, 248 t. 6 c. £2,255

Ammonium Carbonate—
Quebec, 2c ½ c. £34

Benzole—
Dieppe, 65 brls. 24 pns. £517

Borax—
Rotterdam, 1 ck. £4. 10s.

Cobalt—
Seville, 1 c. £47

Chemicals *(otherwise undescribed)*
Melbourne, 117 c. £35

Dyestuffs—
Extracts
Quebec, £336
Logwood
Quebec, 195¾ c. £75

Litharge—

Quebec,	20 t.	3½ c.	£350
,,	8	18½	150

Manure—
Rouen, 1 t. 6 c. £37

Naphtha—
Rouen, £180

Potassium Bichromate—

Rouen,	34 t.	18 c.	£1,131
,,		1,155¼	1,550
New York,		1,199	2,097
Amsterdam,		13 cks.	163
Quebec,		281¼	460
Rotterdam,		29	391
Bergen,		1	13

Potassium Prussiate—
New York, 12 cks. £240
,, 79 c.

Potassium Carbonate—
Bombay, 1 t. 19 c. £35

Pitch—

Quebec,	14¼ t.		£32
Rochefort,	684	4¾ c.	1,265
Santander,	152		182
Rouen,	28	9	29
Dieppe,	150		180

Paraffin Wax—

Japan.	22 t.	14 c.	£623
Bombay,	1	7½	
Riga,	10		190

Sugar of Lead—
Bombay, 4 t. 7 c. £79

Sodium Bichromate—

Bombay,	2 t.		£43. 13s.
Rouen,	16	6¾ c.	417

Tar—

Madras,	68 t.	7 c.	£82
Calcutta,	8	3½	33

PRICES CURRENT.

WEDNESDAY, NOVEMBER 12, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. ..per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅜
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. ,,	1	15	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. per ton	11	2	6
,, ,, (grey), Hull .. .. ,,	11	0	0
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	5	0
,, Carbonate (native) .. .. ,,	3	10	0
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	6	7	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	6
Benzol, 90 % nominal .. .. .. per gallon	0	4	5
,, 50/90 ,, ... ,,	0	3	5
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6
,, (crude 60°) .. .. per gallon	0	1	5
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	7
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	15	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	11
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	57	0	0
,, Sulphate .. .. ,,	18	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	12	6
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	10	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	15	0
,, ,, (grey) .. .. per ton	13	0	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	9
Oils:—			
Cotton-seed .. .. per ton	19	5	0
Linseed .. .. ,,	23	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5½
,, American .. .. ,,	0	0	5⅜
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. ,,	3	5	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	0½
,, Nitrate .. .. ,,	0	2	11
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	2	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	7	6
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	12	6
,, ,, (70 % Caustic Soda) ,, .. ,,	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	6	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. ..per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	31	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. .. ,,	4	5	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	29	10	0
Tin (English Ingots) .. .. ,,	97	00	0
,, Crystals .. .. per lb.	0	0	7
Zinc (Spelter) .. .. per ton.	25	5	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

THE

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TO ADVERTISERS.

SPECIAL NEW YEAR'S NUMBER OF THE "CHEMICAL TRADE JOURNAL."

In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers.

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

On the occasion of the New Year's Special Number, we shall make use of the whole of the lists we have referred to, numbering altogether, as we have stated not less than 10,000 names.

Of course, for this special issue. there will be special prices for advertisements, but those who order a series, either commencing with that number or previously, will have the advantage of our regular tariff rates, of bringing their specialities under the notice of a very large circle of buyers.

As only a limited number of pages will be added for advertisements, early application for space is necessary. We shall be pleased to send tariff of charges to all those who may desire to advertise in this Special Number.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates :—

30 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

THE KELLNER-PARTINGTON PAPER PULP COMPANY.

THE first annual meeting of the shareholders of the Kellner-Partington Paper Pulp Company, Limited, was held on Tuesday afternoon at the Grosvenor Hotel, Manchester, Mr. Edward Partington presiding. There was a large attendance of shareholders.

The directors' report, which was taken as read, was as follows :—

> The works at Barrow were first started in the month of March last, but have only recently been brought into full operation. The whole of the plant is now at work, and turning out pulp of first-class quality, and the present weekly production at current market prices leaves a good margin of profit. It is obvious that the results realised to 30th September afford no indication of the earning capacity of the works; and the directors are of opinion that the trading profits of £2,583. 17s. 6d. which they have to report, is as much as could have been reasonably anticipated under the circumstances incidental to the starting of a new works of this magnitude. The balance of net profit at the company's disposal is £2,677. 2s. 7d., out of which the directors are enabled to declare a dividend at the rate of 5 per cent. per annum on the estimate of about three months' full working. They recommend that this dividend, which will absorb the sum of £2,403. 15s., be declared accordingly, payable on the 19th instant, leaving a balance of £273. 7s. 7d. to be carried forward to the next account. The works at Borregaard are being actively pushed forward, and the foundations and buildings will probably be completed in about three months time. A portion of the principal machinery and plant is already ordered and in course of construction, and manufacturing will, it is hoped, begin about July of next year. From their advantageous situation as regards cheap timber and motive power, paper pulp should cost less to produce here than even at Barrow. The works at Hallein, though not so far advanced, are progressing satisfactorily, and when in full working order these works should compare very favourably as to profit making with those at Borregaard. The Four-and-a-Half per Cent. Mortgage Debenture debt of £36,000., referred to in the company's prospectus, has been paid off, and replaced to the extent of £11,190. by loans on deposit bearing interest of 4 per cent. It will be observed that the interest received on the temporary investment of spare capital and from other sources has been almost sufficient, after deducting bank charges, to provide for the whole of the interest to date on loans and debentures.

The chairman said they had spent on the Hallein property in Austria about £2,800., and though there had been some delay in pushing the matter forward, he learnt from Dr. Kellner that he had been able to make better terms with the Austrian Minister of Agriculture, and that any loss of time had been amply repaid by the saving which had been effected. The directors were taking care that no new enterprises should be entered into without due consideration, for they had at present three works. At the Hallein property near Salzburg in Upper Austria the foundations were already being worked out, and the plans and specifications for the building and the machinery were in hand, so that in twelve months time at least they expected to be able to manufacture pulp there. The Barrow property was worth

£115,000. to £119,000. as it stood, including land, buildings, machinery, stock in trade, and assets of every description, and he believed that the place would return them a respectable dividend on its own merits. But it was now taxed with a large amount of capital which was intended to make the productive power of the company much larger, and a great deal of capital had been subscribed for the purpose of extension. He had as much confidence in the undertaking as he had when he first met them, and though they had experienced a falling off in the value of the manufactured article, they saw an opportunity of saving a great deal of that depreciation by reducing the cost of manufacture. When they compared the Barrow property with the other works, and especially with that at Borregaard in Norway, they would find that the former would never make as much money as the money they were expending at the latter place. The Borregaard property was situated on the edge of a vast forest, the largest forest in Norway, and they got the material at the least possible cost—simply the cutting of the timber and floating it down the river. The property had been bought very cheaply, and there was already an income from tenants. As a site for a pulp works it was second to none in Europe, for there was a tremendous water power which was available at a nominal cost.

Dr. Kellner's letters stated that the Hallein property was of a similarly valuable character.—In answer to Mr. Pilkington, the Chairman said there was a discrepancy between the amount of money shown by the report to the credit of the profit and loss account and the sum which the directors offered as dividend, but that difference was the amount of dividend that he would have been entitled to receive upon his shares to the amount of £42,000. at the rate of 5 per cent. per annum. When he saw the profits that had been arrived at after three months' working, he said that he should be quite willing under the circumstances that his shares should not rank for dividend on this balance sheet, (Applause.) He desired the shareholders to feel that the directors wanted to sail in the same boat as themselves. He did not expect that he would have to do so again, because he believed the next half year would show a far more satisfactory profit. It must be remembered that the large works at Barrow-in-Furness had to be carried on with everything new, with no data to work from as regards machinery and appliances, and everything was in an experimental state. The dividend did not satisfy him, and he wanted it to be more in proportion to that which was held out to the shareholders when they invested their money.

The Chairman, in answer to questions, said there was no intention of going into fresh enterprises until the three works referred to had proved thoroughly successful. The Borregaard and Hallein works would each produce about 100 tons of pulp per week, and in proportion to the turnout would not cost as much as the Barrow works. With regard to 1,160 shares unissued, he explained that they desired to obtain the services of directors to work with Dr. Kellner in Austria, and those shares had been reserved in order to enable the Austrian directors to qualify.

EXPLOSION AT A GASWORKS.—An alarming explosion occurred early on Saturday morning at the Middlesbrough Corporation Gasworks, the cause of which is not yet known. A considerable portion of the works was blown to atoms, and an engineman, named William Ogden, was killed and buried in the debris. The body has, however, been recovered. At a special meeting of the Gas Committee it was decided to inform the public by means of handbills that the gas supply would be very short, and to advise them to arrange other ways of lighting their premises. An inquest on the body of the engineman was opened in the afternoon, and, after some evidence had been taken, was adjourned.

WHITE LEAD AND ITS INVENTORS.

IV.

SPECIALLY CONTRIBUTED.

(Continued from page 273.)

COBLEY, whose patent dates 26th October, 1860, also uses the sub-acetate, which he makes by acting on roasted lead ores with acetic acid vapours, a very doubtful process, and the solution of the sub-acetate is allowed to percolate through a large holder and meets the gas which is introduced at the bottom of the holder by means of pipes; a description which is by no means clear, but apparently is a modification of Cory's method, and whose patent would seem to have invalidated Cobley's.

John Arthur Phillips, a year later, turns his attention to white lead making, and patents a process (1861, No 642) not unlike that of Cobley; he takes the natural carbonate ores of lead which are always more or less impure, roasts them, treats the roasted ore with neutral acetate of lead, whereby a sub-acetate is produced free from iron or other metals which are present in the ore; this solution is used as in the patents previously discussed, and with about as much success.

The next inventor to come forward is Peter Spence, the well-known alum manufacturer, whose patent bears date, September 22nd, 1865, and whose process somewhat differs from any of his predecessors. When lead ores are calcined, they are converted into oxide, or a mixture of oxide and sulphate. Spence takes these roasted ores, and if they contain oxide only treats them with caustic soda, which dissolves out the oxide, or if they contain sulphate, treats them with carbonate of ammonia or soda ash, before the caustic alkali treatment. The alkaline solution of lead is now treated with carbonic acid gas, to precipitate the lead as white lead. It is doubtful whether this process ever went further than the experimental stage or white lead made thereby placed on the market; the economy of the process is somewhat doubtful, although it could be so worked as to give no bye-products; the principal difficulty which would be met with, is that of insuring the complete conversion of the sulphate into carbonate by treatment with soda ash, on this point an opportunity will be taken later on to comment upon, but it seems unnecessary, having once made the carbonate, to dissolve this and reprecipitate it again as Spence does.

Mr. E. Milner, both alone and in conjunction with Mr. J. G. Dale, has taken out a series of patents bearing on the manufacture of white lead; the first to be noticed here is one dated 1868, No. 1117. As a base the patentee uses the oxychloride of lead, which he prepares by treating ten parts of litharge with one part of salt and 60 parts of water, in two days a flocculent compound is formed. This is mixed with some hydroxide of lead, made by treating sulphate, or chloride of lead, with lime or soda; the mixture is put into a vessel and carbonic acid gas passed in for 3 or 4 days, when the white lead will be formed; the patentee says nothing as to the proportions of the hydroxide and oxichloride, nor how he ascertains when the carbonic acid has been passed through sufficiently long; however, these points have not escaped his attention, for in 1872 we again find him patenting a modification of this process, he now mixes 10 parts of finely ground litharge with 1 part of salt and 40 parts of water, and agitates them together for a few hours; this step of the process being reduced in duration from days to hours, then the carbonic acid is passed in until the mixture shows an alkaline reaction, which, one would think had been the case from the start; however this was not wholly satisfactory, as the product varied somewhat in character, and in 1875 a further patent is taken out, the proportion of salt is increased from 1 to 10, to 1 to 4 of litharge, the proportion of water is not altered; the ingredients are put into wooden tanks, the patentee prefers yellow pine, and he says oak tanks will not do; when the basic chloride has been formed, the whole mass is put into wooden vessels, fitted with beaters, and carbonic acid gas passed in. This is done until, on a portion being taken out in a glass, the precipitated lead settles on the sides of the glass in an arborescent form, resembling frosted glass, leaving the liquid clear. If too little gas has been passed in, the mixture in the test glass will be of a uniform character, while if too much has been passed in, then the lead settles out too rapidly, and is somewhat gritty. Samples of white lead made by this process, were exhibited at the Inventions Exhibition in 1885, and were favourably reported on, in a description which has been given elsewhere, of the process, it is stated that the oxychloride of lead is mixed with caustic soda and salt, in lead lined tanks, before passing in the carbonic acid, but the patentee says nothing of this in his specification. The process was worked by the Sankey White Lead Co., and the white lead produced by them is generally considered of good quality.

Martin, 1876, No. 223, looks with a favourable eye on the use of basic acetate of lead, and seems to have worked out some of the conditions by which amorphous white lead can be obtained, for he says that to get the white lead in a non-crystallisable condition much depends on the strength of the solution, if the water used to dissolve the acetate

be in excess, too much basic salt is formed, the action of the carbonic acid is too energetic, and the product is crystalline; the inventor takes neutral acetate of lead, dissolves it in 1½ times its weight of water, into 3,600 gallons of this 4 to 6 tons of lead are placed, and ½ ton of litharge. Carbonic acid is passed in for an hour, when all the litharge will have been converted into carbonate; the addition of half a ton of litharge is continued every hour, until the vessel is full of white lead; there is a novelty in this process, the patentee himself considers that the use of strong solutions is the novel feature, and so it is, as is also the method of adding the litharge in small quantities, what purpose the lead serves is uncertain, the current of carbonic acid is continued until the liquor shows an acid reaction. What commercial success the process met with is not known, nor whether any large quantities of white lead were ever made with it.

Cookson, in 1876, 708, also makes use of subacetate of lead, and the novelty of his process is that it is injected into chambers in the form of spray by means of a powerful jet of carbonic acid. The practicability of the process seems rather doubtful, and it would scarcely have any advantages over Cory's process.

Mr. Alex. Orr takes litharge, mixes it with an equal quantity of water and a very small quantity of acetic acid, one-tenth of a lb. for every 100 lbs. of litharge, in a closed vessel capable of standing a pressure of 5 to 10 lbs., and passes in carbonic acid gas. He states that the homologues of acetic acid, propionic, butyric, or valerianic acid may be used in place of acetic acid; but it is obvious that on the score of cost it is doubtful whether they would be used on a large scale. The quantity of acetic acid used is so small that it scarcely seems possible that it would have any influence on the result.

Prof. MacIvor patented a process, in 1888, which consists in dissolving litharge in acetate of ammonia, passing carbonic acid gas through the solution which precipitates the lead as carbonate, the acetate of ammonia is unaffected and can be used over again; the operation only takes a few hours. The novelty in this process is the use of acetate of ammonia to dissolve the litharge; the use of this body and of other acetates had not been previously patented, but it is believed that other inventors had used alkaline acetates for the purpose. The only point which remains to be considered is the composition of the precipitated white lead, it does not seem likely that this would have the same composition as Dutch white lead, it is more likely to be normal carbonate or at the most a basic carbonate, but not a combination of the carbonate and hydroxide.

Eyckens, in 1886, No. 1,832, uses nitrate of lead as a base for manufacturing white lead, and he gives the following series of reactions as the principle of his process: 1st, That when solutions of nitrate of lead are treated with lead the latter is converted into hydroxide, according to the equation, thus:—

$$Pb\,N_2\,O_4 + H_2O + Pb = N_2\,O_2 + Pb\,O + Pb\,H_2\,O_2.$$

2nd, On the property possessed by nitrate of lead of losing oxygen, and being converted thus:—

$$Pb\,N_2\,O_4 + H_2\,O + Pb = N_2\,O_2 + Pb\,O + Pb\,H_2\,O_2.$$

These are rather curious principles, here we have the same equation, illustrating two different reactions; one must be wrong. Which is it? so far as regards the first, it is doubtful whether, when nitrate of lead under the conditions specified does produce hydrate, experiments made by the writer show that a solution of nitrate of lead has no action on lead in the cold, when boiled there is some action, but this appears to be the conversion of lead into oxide, and the formation of nitrite of lead, no nitrogen dioxide appears to be formed; boiling nitrate of lead with lead does not appear to lead to the change shown in the second case.

The patentee also says that solutions of nitrite of lead form basic salts and the excess of base in the presence of water tends to form lead hydrate. Basic nitrite of lead in solution, and in contact with carbonic acid, is converted into nitrite of lead and white lead.

According to the following equation,

$$4\,(PbO)\,N_2O_3 + 2H_2O + 2CO_2 =$$
$$Pb\,N_2O_4 + H_2O + 2\,PbCO_3 + PbH_2O_2$$

To have water H_2O on both sides of this equation seems necessary. Eyckens, to carry out his process, uses a closed vessel called a converter, in this is placed lead, in the form of fine shavings, and a solution of nitrite of lead, then there is forced through a mixture of heated carbonic acid and air, by the action of these, white lead is formed and which is drawn off from the bottom of the converter. The gases, after passing through the converter, are passed into towers filled with solutions of polybasic nitrite of lead, which absorbs all the nitrous gas produced in the reaction. The nitrite of lead used is recovered for re-use. Whether this process is practicable is rather uncertain.

What are the conditions of perfect success in these carbonic acid precipitation processes is not definitely known, most probably they will vary with the particular salt of lead used and the degree of its basicity, the fault generally appears to be that the precipitate contains too much carbonate and not enough hydrate of lead.

Another group of processes for the preparation of white lead, the fourth group consists of treating lead compounds with alkaline carbonates.

The earliest of these processes which received a patent is that of Archibald, Earl of Dundonald, who in 1797 conceived a new method of making ceruse or white lead; and he does this by first converting litharge into oxychloride by means of salt or chloride, or, as he calls it, "muriat" of potash, the product is then treated with "vegetable alkali" to which carbonate of potash, when carbonate of lead and "chloride of potash" are formed and they are separated in the usual way. There is no doubt about carbonate of lead being formed, but the question is how much and in what form is it; it is extremely doubtful as to its being in the form of white lead.

James Keir, in 1806, essays his hand at the same process, and there does not seem to be anything to choose between the two, at all events the patent specifications do not allow any one to clearly distinguish between the two methods.

Hemming, in 1836, uses the nitrate of lead, which he dissolves in water and precipitates with carbonate of soda, but he gives no details as to strength of solutions. It may here be pointed out that adding solutions of carbonate of soda to solutions of lead gives a white precipitate of a more or less basic carbonate, which, however, is not *white lead*, it is never basic enough, and further the precipitate is generally of too crystalline a nature; to make white lead by precipitation processes is not easy, and the right conditions have yet to be worked out.

Charles Watt and T. R. Tebbutt prepare (1838, No. 7,531) white lead by a variety of ways; one method is to treat the sulphate with lime water and alkaline carbonate; when a white hydrate containing much carbonate is formed. Now these gentlemen evidently did not know what the composition of white lead is, for they propose, to ensure it being a "perfect carbonate," to treat it with carbonic acid. They also used nitrate of lead, chloride of lead, and fatty compounds of lead. The most curious point about their methods is the roundabout way they prepare their lead compounds before carbonating them; evidently the question of cost did not trouble them.

Thomas R. Sewell (1838, No. 7,736) has already claimed attention, he also, among other processes, proposes to use basic salts of lead and precipitates them with carbonate of soda or potash.

John Leigh, a year later, treated the sulphate or chloride of lead with carbonate of ammonia. Ammoniacal salts are not the best compounds to use in connection with white lead making, as they assert an appreciably solvent action on that product, and hence there is some loss, if this point be overlooked.

Mr. Hugh Lee Pattinson bears an honoured name in connection with lead and its products; naturally we find him endeavouring to improve the preparation of white lead, one of his methods, patented in 1840, was to treat chloride of lead with carbonate of lime in chemical equivalents, these are ground together in a mill for several hours with water, and allowed to stand all night, the liquor, consisting principally of a solution of chloride of calcium, is drawn off, the grinding continued as before; these operations of grinding and settling are continued day by day until the water comes off tasteless. The lead is then all converted into carbonate, which is dried and made ready for sale. At the end a little alkaline carbonate is added to ensure the conversion of any excess of chloride into carbonate, a modification of the process consisted in treating the mixture of chloride of lead and chalk with carbonic acid in revolving barrels.

He also speaks of using a solution of chalk in carbonic acid to precipitate salts of lead with.

A year later he uses magnesium carbonate for the same purpose, and as he has found apparently that a pure carbonate of lead such as would be obtained by the above processes, he leaves some chloride of lead unacted upon, and converts this into hydroxide by treatment with caustic alkali, this is done by grinding the materials together, allowing them to stand for a few days and washing with water. So far as is known, the process was not a commercial success, it was tedious and required a good deal of manipulation, and the chances that the product is equal to Dutch white lead are rather remote.

Cooper, in 1859, follows the example of Watt and Tebbutt, and uses the sulphate, 25 lbs. of which are treated with a saturated solution of 10 lbs. of pearlash, when apparently the carbonate is formed immediately; as a process for making white lead this will not answer.

Delafield, some seven years later, following on the lines of Hemming, uses nitrate of lead, which he takes from 112 lbs. of nitric acid of 36° B, and 112 lbs. of oxide of lead, and sufficient water to make a saturated solution, this is heated by steam to 200° F., and a hot solution of pearlash, 70 lbs., is added. The patentee considers that heat is very important, for he makes a great point of the use of steam for raising the temperature of the solutions; it is very doubtful if the heat has much benefit in this case, as it would probably tend to make the precipitate more crystalline, which is not desirable.

Hannen, in 1868, practically re-patents Dundonald's process, with probably no better results.

J. G. Dale and E. Milner, in 1869, patented a method of making white lead by grinding litharge or basic salts of lead with water and bicarbonate of soda, or the materials may be mixed in solution; presumably the process was not successful, for the same inventors have in subsequent patents abandoned the use of alkaline carbonates.

Isham Baggs is evidently not aware of Dale's patent, for he, in 1870, patents the process of manufacture by grinding lead salts with alkaline carbonates; it is truly wonderful how patentees will take out such general patents; in these days, patents to be valid must be more specific in character.

Rowan, 1872, uses the same materials but heats them under a pressure of 30—40 lbs, whether there is any improvement in the quality is not stated.

Nine years afterwards, Condy (1881, No 1,095) again tries to make white lead by using basic acetate of lead and alkaline carbonates, but he prefers to use what he calls the tribasic acetate which he makes as follows: acetic acid of 1·045 sp. gr. is diluted with five times its volume of water, and allowed to act upon metallic lead until a solution of spec. grav. 1 2 is obtained, this is evaporated to dryness, when the bibasic acetate is said to be obtained, this is grouped up with water and litharge in the proportion of 112 lbs. litharge, 275 lbs. of bibasic acetate of lead and 50 of water, or he takes 189 lbs. of neutral acetate of lead. 229 lbs. of litharge and 21 lbs. of water and grinds all these together, after grinding, they are allowed to stand for 48 hours, then dissolved in 10 times their weight of water, then for every 112 lbs. of litharge in the tribasic acetate 84 lbs of solid bicarbonate of soda are added; care is however taken that there is a little lead left in solution not precipitated by the alkaline bicarbonate. Mr. Condy's white lead is a good product, nearly, although not quite, equal to Dutch lead. In a subsequent patent, Mr. Condy somewhat modifies the procedure, chiefly because the white lead produced by the above process sometimes takes a tint when ground in oil. The new process consists in treating granulated lead with a solution of 1 part of acetic acid of 1·045 sp. gr, in 12½ parts of water, until a solution of lead is obtained of a sp. gr. of 1·040, this is then mixed with solid bicarbonate of soda in the proportion of 30 lbs. for every 60 lbs. of acid used to dissolve the lead 750 lbs. of water being used to dilute the lead solution. The product is quite satisfactory.

Mr. Lowe took out a patent in 1887, No. 9,122; he starts with 50 lbs. of lead acetate, or 43·6lbs. of lead nitrate, dissolves these in 250 to 300 lbs. of water. He differs very much from Martin in the proportion of water he uses, then mixes the solution with 23 lbs. of solid bicarbonate of soda, or 26·4 lbs. of solid bicarbonate of potash, when a precipitate of more or less basic carbonate will be obtained. So far the process differs but little from Condy's, but Mr. Lowe now takes 25 lbs. of lead acetate, mixes it with 125 lbs. of water, and 15 lbs. of litharge, digests these for 8 to 10 hours, then mixes the product with the lead carbonate obtained in the first operation. The result is that white-lead is precipitated. Unlike other patentees Mr. Lowe appends an analysis of his product as follows:—

Lead monoxide - -	86·185
Carbonic acid - - -	11·270
Water - - - - -	2·545
	100 000

This does not differ to any material extent from the composition of a typical sample of Dutch white-lead.

It is extremely doubtful whether white-lead, corresponding in composition with Dutch white-lead, can be made by precipitating lead salts with carbonates; it is most probable that the precipitates obtained, although basic in character, contain the excess of base as oxide and not as hydroxide. Much will depend upon the strength of the solution, its temperature and the character of the salt of lead and its basicity. Information on these points is wanting, and would-be inventors had better consider them and find out their bearing on the composition of the precipitate produced before rushing into the Patent Office.

Heavy Penalty for Black Smoke.—At the Salford Police Court, before Mr. J. Makinson, stipendiary, Messrs. Peter Reid and Sons, dyers, bleachers, and calico printers, Caledonian Dyeworks, Indigo-street, Whit Lane, Pendleton, were summoned at the instance of the Health Committee of the Salford Corporation for causing a smoke nuisance by using furnaces not constructed to consume their own smoke, and the negligent use of smoke consuming furnaces. Mr. A. Holmes, deputy town clerk, appeared in support of the summons. Mr. C. E. Thompstone, inspector, stated that on the afternoon of September 23 he took observations of the chimney of defendant's works. During one hour, from three to four o'clock, he saw dense smoke emitted for a period of eight minutes. Defendants, who had been several times summoned for a similar offence, were fined £10. and costs.

OCCURRENCE AND EXTRACTION OF OZOKERITE IN GALICIA.

THE most important deposit of ozokerite is near Borislaw, where it occurs in a marl containing salt. The wax is found in irregular lumps, sometimes of great size, or in layers, which frequently die out completely. The neighbouring rock consists of clay slate, marl and sandstone.

The centre of the basin is richest in wax; in some cases masses of such extent have been tapped that the miners have hardly had time to escape before the workings were filled with the plastic mineral. Such a deposit was recently found in the deepest shaft at Borislaw, at a depth of 208 metres (227 yards). In general, however, the yield of wax varies at from 2 to 8 per cent. of the mineral extracted. Ozokerite was first found in this district in 1854 by Doms, who was in search of petroleum, with which much of the ground is saturated. At first it was regarded as an unwelcome companion to the petroleum, as it frequently caused the timbering of the shafts to collapse. It was not until about 20 years later that this substance began to attain commercial importance, a method having then been discovered of producing from it a substance resembling beeswax, and named ceresin.

In 1865 ozokerite, which had previously been regarded as a Crown mineral, was declared free, and the consequence was that a number of shafts were sunk in the district, and much speculation ensued. The land being parcelled out in small plots, the shafts were sunk in the immediate neighbourhood of each other, and much waste and danger ensued. In 1886 the present law was passed, according to which the right of mining for ozokerite may be separated from the ownership of the land. The extraction is now carried out under official supervision.

In nearly every case the mineral is raised through vertical shafts or pits, over which a wooden roof is erected. The section of the shafts in the first instance is 3 to 4 square metres (32 sq. ft. to 43 sq. ft.); but when the ozokerite formation is reached, an inner shaft 1 metre square (10·76 sq. ft.) is formed of timber, and the space between this and the timbering of the larger shaft is filled with a rich clay. This construction is adopted to exclude the surface water, which is kept down by hand-pumps during sinking. From the bottom of the shafts levels are driven into the ozokerite ground, the richer portions being raised and the refuse used to fill up the old workings. The softer parts of the marl are dislodged by means of pick or wedge; but where the rock is hard, and the permission of the mining authorities can be obtained, dynamite is used. The mineral is raised by hand, in skips or tubs holding 40 to 50 kilos. (88 to 110 lb.) Hand ventilators are used for the purpose of ventilation, but explosions of gas are not uncommon, especially after Sundays and holidays. Fatal accidents are, however, rare. Safety-lamps are used in all the mines. The timbering of the shafts requires constant renewal and repairs; in some cases it is almost impossible to keep the shafts perpendicular.

The water is usually raised in tubs, and much difficulty is experienced in getting rid of it after it reaches the surface, on account of the numerous shafts and the broken nature of the ground. The mineral, when it leaves the tubs, is sorted by hand. The waste rock is picked out and tipped to spoil, lumps of ozokerite are specially selected, and the remainder of the rock, containing fragments of wax, is tipped into tanks full of water. On being well stirred, most of the wax rises to the surface, and is skimmed off. The residue still contains from 2 to 3 per cent. of wax. The quantity of waste mineral being considerable, and the distance between the shafts small, a special railway has been built to remove the residues from the immediate neighbourhood of the mines.

Only one attempt has been made to mine on a large scale for ozokerite. In this case a circular shaft, 2 metres (6 ft. 7 in.) in diameter, and lined with iron tubing, was sunk outside the ozokerite zone, and the deposit was reached by galleries. Trucks holding 500 kilos. (1,102 lb.) were used, and both ventilation and pumping were done by steam power. The operations on a large scale do not, however, seem to have been successful, the French company which carried them out having now ceased working.

The production of ozokerite in the Borislaw district amounted in 1887 to 96 per cent. of the total output in Galicia, and was valued at £152,900.—*Oil, Paint, and Drug Reporter.*

Boiler Explosions.—A Parliamentary paper just published, contains the eighth report upon the working of the Boiler Explosions Act of 1882. The report deals with the twelve months ended June 30, 1890, during which period there were 77 cases of boiler explosions, 30 afloat and 47 on land. The total number of inquiries held exceeds that for any year since the passing of the Act, but in a considerable proportion of cases the explosions were not of a serious character, and the total number of lives lost, 21, is below the average of the preceding seven years. The results obtained from the working of the Act for a period of eight years afford no ground for assuming that there is any increase in negligence on the part of steam users.

NITRATE OF SODA AND ITS USES.

IT has been a much discussed question for a number of years, as to the most feasible plan of educating the farmers of this country, in the proper use of nitrate of soda for fertilizing purposes, and at various periods it has been stated through the press, and by consuls, that the government of Chili were about to donate a sum of money for the purpose of sending competent agents to that country for that object. The matter dragged along, however, and with it the apparent accustomed apathy of that government, nothing tangible was accomplished. Not satisfied with the manner in which the subject was being carried on, Mr. F. B. Nichols went to work, with a view to reviving interest in the matter, and endeavoured to have a sum of money offered for a prize essay on the use of the article, which had been tried with decided success some time previous in Europe. In his first attempt Mr. Nichols was thwarted, for certain reasons, and the subject was dropped for the time being. Not content with his failure he again set to work, and to his surprise found that those who had previously opposed his plan, were apparently only too glad to co-operate with him. Acting upon advice, Mr. Nichols wrote to influential parties abroad and as a result he succeeded in securing an appropriation. Mr. Joseph Harris, M.S., who has been for many years one of the editors of the *American Agriculturalist*, was selected to perform the work, and this gentleman has written an exhaustive pamphlet, which covers the subject in a thorough and concise manner. In the introduction to his work, Mr. Harris says:

"Farmers and gardeners sometimes express surprise that agricultural chemists talk so much about nitrogen. When it is known, however, that of all the organic matter of plants and manures—in other words, all the matter which is driven off by burning—the only element of any direct value as plant food is nitrogen, it will be readily seen that nitrogen is entitled to even greater attention than it at present receives.

"Farmers and gardeners and fruit growers fully recognise the value of barn-yard manure. In a ton of ordinary manure, containing 75 per cent. of water, there is 1,275 pounds of organic matter and 225 pounds of ash. Except for its mechanical and indirect benefit to the soil, all the manurial value of this 1,275 pounds of organic matter is due to the nitrogen which it contains. Is it any wonder, therefore, that we hear so much about nitrogen?"

A little over forty year ago, says the *Oil, Paint, and Drug Reporter*. it was claimed that the chief value of manure was due to the mineral matter or ashes that it contained. To test this matter in a practical way, Mr. Lawes, the first year of his since celebrated experiments on wheat at Rothamsted, applied 14 tons of barn-yard manure on one plot, and, on an adjoining plot, the ashes of 14 tons of barn-yard manure.

The result was as follows:—

1. No manure, 15 bushels wheat per acre.
2. 14 tons barn-yard manure, 20½ bushels wheat per acre.
3. The ashes of 14 tons of barn-yard manure, 14¾ bushels wheat per acre.

Since then it has been shown conclusively, as we said before, that all there is of actual value as plant food in the large mass of organic matter which we apply in barn-yard manure, is the nitrogen which it contains.

Furthermore, it has been proved that, for at least many of our crops, the nitrogen must be converted into nitric acid and the nitric acid into nitrate before it furnishes appropriate food for plants.

The importance of nitrate of soda as a manure, therefore, is obvious.

We have used nitrate of soda for years on our own farm. There is not a crop we grow that does not almost instantly show a decided benefit from its application. In saying this, however, it does not follow that its application is alike profitable on all crops. The profit depends very much on the price of the produce. Unfortunately, farm produce is low; but great as has been the reduction in the price of farm produce, the reduction in the price of nitrate of soda has been still greater.

In his celebrated paper read before the Society of Arts in 1877, Mr. (now Sir) John B. Lawes, certainly the most distinguised agriculturist of the age, said: "A future generation of British farmers will doubtless hear with some surprise that at the close of the manure season of 1876, there were 40,000 tons of nitrate of soda in our docks which could not find purchasers, although the price did not exceed 60 dols. or 65 dols. per ton." A future generation of American farmers will doubtless read with surprise that a decade, or more later, though offered at a still lower price, not a hundred tons a year, all told, were used in the United States as manure.

The reason so few have heretofore used nitrate in this country is not because it is unprofitable, but simply because its merits are unknown, and because dealers in fertilisers do not keep it for sale.

We have said that nitrate of soda will benefit nearly every crop we grow, but it does not follow from this that it is equally profitable on all crops. It is precisely here that those who use nitrate for the first time are likely to fail. They will be apt to use it on corn or some other cheap product. Nitrate, theoretically (if needed), will increase a crop of corn as much as it will a crop of wheat, but the corn will not sell in market, on the average, for more than one-half as much per 100 pounds as the wheat. And so of oats and barley. The nitrate, other things being equal, will increase the crop of oats as much as the crop of barley, but with us, good barley for malting purposes often sells for double the price of oats per 100 pounds.

Nitrate of soda knows nothing about prices and but little about "bushels." It will do its duty faithfully and promptly without regard to market reports.

It seems strange that this question of the value of the produce has received so little attention. We have a parallel case in regard to renting land. The proprietor furnishes the land and half the seed, the tenant does all the work and gives the land-owner half the crop. A crop of barley, oats, or wheat can be sown and harvested with less than half the labour required by a crop of potatoes or roots. And yet we have rarely met a tenant who took this point into consideration.

Part of a field would be put into barley and part into corn and part into potatoes and part into roots. He did not understand that, if he got a good crop, he paid the land-owner double and treble, and sometimes four or five times the rent for an acre of roots or potatoes as for an acre of barley or oats or wheat.

Nitrate of soda has been not unfrequently used with as little thought. It will increase the productiveness of nearly every crop that is grown. But there is a great difference in the profitableness of its application. And this not so much owing to any market difference in the effect produced as to the price that can be obtained for the crop.

And here again there is much misconception. We sell by the bushel. A bushel of oats weighs 32 lbs.; a bushel of barley 48 lbs.; a bushel of corn 56 lbs, and a bushel of wheat 60 lbs. As we said before, nitrate of soda knows nothing of commercial measure or bulk. And it is equally true that weight alone is misleading. A commercial bushel of potatoes weigh as much as a bushel of wheat, but the bushel of potatoes is four-fifths water, and it ought to be, and is, as easy to grow five bushels of potatoes as one bushel of wheat. And yet it is not uncommon for a bushel of potatoes to command as high a price as a bushel of wheat. Nitrate of soda knows nothing about these peculiarities of the market; intelligent farmers, however, should study the subject and be thus prepared to apply the nitrate where it is likely to return the most money.

Nitrate of soda can be used with great profit.

Nitrogen is the most costly ingredient of manures. One thousand lbs. of stable manure rarely contains more than 5 lbs. of nitrogen.

We will not say that no plant can grow in a soil destitute of nitrogen, but it may be safely affirmed that no profitable crop can be grown, unless the soil itself or the manure which is used, contains nitrogen. This is an admitted fact.

It has been asserted that the soil contains all the nitrogen that plants need, and that if we have poor crops it is owing to a lack of the mineral or ash constituents of plants.

There are soils, undoubtedly, which contain nitrogen enough to give us fair crops, with or without the aid of mineral fertilizers. But maximum crops are rarely, if ever, produced for any length of time without the direct or indirect application of nitrogen.

By maximum crops, we mean an amount of produce which the season is capable of producing. In some seasons, 25 bushels of wheat per acre is a maximum crop; while in other seasons, the same land, the same manure, the same variety and the same treatment will produce 50 bushels per acre.

In England, those farmers who use large quantities of manure frequently fail to get large crops of wheat from lack of sunshine; in America we have plenty of sun, but we rarely get as large crops as are grown in England. Why?

Imperfect tillage, want of drainage, late sowing, and weeds, greatly reduce our crops; but on well-managed farms, the reason our crops do not come up to the English standard is, essentially, the want of available nitrogen in the soil.

ANOTHER NITRATE COMBINATION.—The last homeward mail from Pisagua brings accounts of a meeting of nitrate producers held at Iquique on the 29th ult. Resolutions were passed expressive of the opinion that the only remedy for the present state of affairs "is a combination or agreement amongst nitrate producers to restrict the output." It is estimated that the quantity of nitrate exported in 1891 should not exceed eighteen million Spanish quintals. A representative visit to each nitrate establishment is proposed with the object af assessing productive capacity. On report being made a statement will be drawn up showing the proportion that each oficina would be awarded. It is incidentally mentioned that many meetings have been held to discuss commercial affairs so far as regards nitrate, but as a generality discussions have ceased through discord.

Official Memoranda.

(From the Board of Trade Journal.)

V.—NEW CUSTOMS TARIFF OF CANADA—*Concluded from Page 243.*

THE following is a statement of the rates of import duty now levied under the new Customs tariff of Canada, in continuation of that published at pp. 409—18 of the *Board of Trade Journal* for last month. The conclusion of the tariff will appear next month.

Articles.	Duties levied.
	Dols. Cts.
India-rubber clothing, or clothing made waterproof with india-rubber, not elsewhere specified	35% *ad val.*
Rubber belting, hose, packing, mats and matting, and cotton or linen hose lined with rubber	Lb. 0·05 and 15% *ad val.*
India-rubber vulcanised handles for knives and forks	10% *ad val.*
Gutta-percha manufactures	25% *ad val.*
Leather board and leatheroid	Lb. 0·03
Belting of leather or other material not elsewhere specified	25% *ad val.*
Belting leather and upper leather, including kid, lamb, sheep, and calf, tanned, but not dressed, waxed or glazed	15% *ad val.*
If dressed, waxed, or glazed	20% *ad val.*
Leather, sole	Lb. 0·00½ and 15% *ad val.*
Leather, sole, tanned, but rough or undressed	10% *ad val.*
Drain tiles not glazed	20% *ad val.*
Drain-pipes, sewer-pipes, chimney linings, or vents and inverted blocks, glazed or unglazed, and earthenware tiles	35% *ad val.*
Glass carboys and demijohns, empty or filled, bottles and decanters, flasks and phials, of less capacity than 8 oz.	30% *ad val.*
Flasks and phials of 8 oz. capacity and over, telegraph and lightning rod insulators, jars and glass balls, and cut, pressed, or moulded tableware	Doz. pieces 0.05 and 30% *ad val.*
Lamp glass light and electric light shades, lamps and lamp chimneys, side lights and head lights, globes for lanterns, lamps, electric lights, and gas lights not elsewhere specified	30% *ad val.*
Common and colourless window glass, and plain, coloured, stained, or tinted or muffled glass in sheets	20% *ad val.*
Ornamental, figured, and enamelled coloured glass, painted and vitrified glass, figured, enamelled, and obscured white glass, and rough-rolled plate glass	25% *ad val.*
Plate glass, not coloured, in panes of not over 30 square feet	Sq. ft. 0·06
Plate glass in panes of over 30 and not over 70 sq. ft. each	,, 0·08
All other glass and manufactures of glass not otherwise provided for, including bent plate glass	20% *ad val.*
Photographic dry plates	Sq. ft. 0·09
Albuminised paper chemically prepared for photographers' use	25% *ad val.*
Ink for writing	25% *ad val.*
Old and scrap copper, copper in pigs, bars, rods, bolts, ingots, and sheathing not planished or coated, and copper seamless drawn tubing	10% *ad val.*
Phosphor bronze in blocks, bars, sheets, and wires	10% *ad val.*
Ferro-manganese, ferro-silicon, spiegel, steel bloom ends, and crop ends of steel rails, for the manufacture of iron or steel	Ton 2·00
Lead bars, blocks, and sheets	100 lbs. 0·60
Do., old scrap and pig	,, 0·40
Lead pipe and lead shot	Lb. 0·01½
Do. and all manufactures of lead not otherwise specified	30% *ad val.*
Nickel anodes	10% *ad val.*
Tin crystals	20% *ad val.*
Zinc chloride, salts and sulphate of	5% *ad val.*
Zinc, manufactures of, not elsewhere specified	25% *ad val.*
Cement, burnt and unground	100 lbs. 0·07½
Cement, hydraulic, or water lime, ground, including barrels	Barrel 0·40
Cement in bulk or in bags	Bushel 0·09
Cement, Portland or Roman, shall be classed with all other cement at specific rates as above provided.	
Water limestone or cement stone	Ton of 13 cub. ft. 1·00
Coal, bituminous	Ton of 2,000 lbs. 0·60
Coal dust	20% *ad val.*
Coal tar and coal pitch	10% *ad val.*
Coke	Ton of 2,000 lbs. 0·50
Plaster of Paris or gypsum, ground, not calcined	100 lbs. 0·10
Plaster of Paris, calcined or manufactured, 15 cents per 100 lbs. or 45 cents per barrel of not over 300 lbs.	,, 0·15
Plumbago	15% *ad val.*
Ditto, all manufactures of, not elsewhere specified	30% *ad val.*
Salt, coarse (not to include salt imported from the United Kingdom or any British possession, or salt imported for the use of the sea or gulf fisheries, which shall be free of duty)	100 lbs. 0·10
Do., fine, in bulk	,, 0·10
Do., in bags, barrels, or other packages (the bags, barrels, or other packages to bear the same duty as if imported empty)	,, 0·15
Saltpetre	20% *ad val.*
Asbestos, in any form other than crude, and all manufactures thereof	25% *ad val*
Barrels containing linseed oil	Each 0·25
Barrels, containing petroleum or its products, or any mixture of which petroleum forms a part when such contents are chargeable with a specific duty	,, 0·40
Celluloid, moulded into sizes for handles of knives and forks, not bored nor otherwise manufactured; also moulded celluloid balls and cylinders coated with tin foil or not, but not finished or further manufactured.	10% *ad val.*
Fireworks	25% *ad val.*
Gun, rifle, and pistol cartridges, cartridge cases of all kinds and materials, percussion caps, and gun wads of all kinds	35% *ad val.*
Blasting and mining powder	Lb. 0·03
Canister powder in pound and half tins	,, 0·15
Cannon and musket powder in kegs and barrels	,, 0·04
Giant powder, dualin, dynamite, and other explosives in which nitroglycerine is a constituent part	,, 0·05 and 20% *ad val.*
Gun, rifle, and sporting powder in kegs, half kegs, or quarter kegs, and other similar packages	Lb. 0·05
Nitro-glycerine	,, 0·10 and 20% *ad val.*
Oil, spermaceti, whale and other fish oils, and all other articles the produce of the fisheries, not specially provided for	20% *ad val.*

EXEMPTIONS.

The following articles are exempt from Customs duty:—

Bones, crude, not manufactured, burned, calcined, ground, or steamed; bone-dust and bone-ash for manufacture of phosphate and fertilisers; celluloid-xylonite or xyolite in sheets, and in lumps, blocks, or balls, in the rough; ammonia, sulphate of; salammoniac; alums in bulk only, ground or unground; aluminium or aluminium and alumina and chloride of aluminium, or chloralum, sulphate of alumina and alum cake; antimony, not ground, pulverised, or otherwise manufactured; arsenic; argal or argols, not refined; cream of tartar, in crystals; borax, ground or unground, in bulk of not less than 25 lbs. only; boracic acid; brimstone, crude, or in roll or flower; sulphur in roll or flower; bromine; cherry heat welding compound; cinnabar;

cobalt, ore of; ashes, pot and pearl, in packages of not less than 25 lbs. weight; kainite or German potash salts for fertilisers; potash, German mineral; potash, muriate and bichromate of, crude; soda, sulphate of, crude, known as salt cake; soda ash, caustic soda in drums, silicate of soda in crystals or in solution, bichromate of soda, nitrate of soda, or cubic nitre, salsoda, sulphide of sodium arseniate, binarseniate, chloride and stannate of soda; iodine, crude; litharge; manganese, oxide of; phosphorous; sulphate of iron (copperas), and sulphate of copper (blue vitriol); ultramarine blue, dry or in pulp; verdigris, or subacetate of copper, dry; whiting or whitening, gilders' whiting and Paris white.

Dragon's blood; musk, in pods or in grains; oxalic acid; quinine, sulphate of, in powder; aniline dyes and coal-tar dyes, in bulk or in packages of not less than 1 lb. in weight, including alizarine and artifical alizarine; aniline oil, crude; aniline salts and arseniate of aniline; annatto, liquid or solid; annatto seed; barilla; berries for dyeing or used for composing dyes; cochineal; dyeing or tanning articles, in a crude state, used in dyeing or tanning, not elsewhere specified; iron liquor, solution of acetate of iron for dyeing and calico printing; red liquor, a crude acetate of aluminium, prepared pyroligneous acid, for dyeing and calico printing; extracts of logwood, fustic, oak, and of oak bark; indigo; indigo auxiliary or zinc dust; do. paste, and extract of; lac-dye, crude, seed, button, stick and shell; madder and munjeet, or Indian madder ground or prepared, and all extracts of; persia, or extract of archill and cudbear; terra japonica, gambier, or cutch; turmeric; chloride of lime; colours, metallic, viz.: oxides of cobalt, zinc and tin, not elsewhere specified; ores of metals of all kinds; chalk stone, china or Cornwall stone, felspar and cliff stone, ground or unground; flint, flints and ground flint stones; emery in blocks, crushed or ground; gypsum, crude (sulphate of lime); pumice and pumice stone, ground or unground; anthracite coal and anthracite coal dust; gas coke (the product of gas-works), when used in Canadian manufactures only; asphalt or asphaltum and bone pitch, crude only; clays; fire-clay; pipe-clay, unmanufactured; fuller's earth; meerschaum, crude or raw; kryolite or cryolite, mineral.

Gannister; sand; silex, or crystallised quartz; bismuth, metallic, in its natural state; Britannia metal, in pigs and bars; old scrap brass and brass in sheets or plates, of not less than 4 ins. in width; copper, in sheets or plates, of not less than 4 ins. in width; precipitate of copper, crude; nickel; quicksilver; silver, German silver and nickel silver, rolled or in sheets; spelter, in blocks and pigs; tin in blocks, pigs, bars, and sheets, and plates and tinfoil; yellow metal, in bolts, bars, and for sheathing; zinc. in blocks, pigs and sheets; Burgundy pitch; pitch (pine) in packages of not less than 15 gallons each; tar (pine) in packages of not less than 15 gallons each; varnish, black and bright, for ships' use; caoutchouc, unmanufactured; india-rubber, unmanufactured; rubber, crude, and hard rubber in sheets, but not further manufactured; recovered rubber and rubber substitute; crude gutta percha.

Belladonna leaves; buchu leaves; foliæ digitalis; hyoscyamus, or henbane leaf; senna, inleaves; camomile flowers; conium cicuta, or hemlock seed and leaf; saffron and safflower, and extract of; saffron cake: hemp, undressed; India hemp (crude drug); jute; jute butts; Manilla grass; oakum; junk, old; cinchona bark; hemlock bark; oak bark; tanners' bark; camwood and sumac and extract for dyeing or tanning purposes, when not further manufactured than crushed or ground; nut galls; litmus and all lichens, prepared and not prepared; Iceland moss and other mosses and seaweed, crude or in their natural state, or cleaned only; kelp; seaweed, not elsewhere specified; alkanet root, crude, crushed, or ground; roots, medicinal, viz.: aconite, calumba, ipecacuanha, sarsaparilla, squills, taraxacum, rhubarb, and valerian; gentian root; ginseng root; jalap root; liquorice root, not ground; iris, orris root.

Gums, viz.: amber, arabic, Australian, copal, dammar, kaurie, mastic, sandarac, Senegal, shellac, and white shellac in gum or flake, for manufacturing purposes, and gum tragacanth, gum gedda, and gum barberry; resin or rosin, in packages of not less than 100 lbs; turpentine, raw or crude; oil cake and oil-cake meal, cotton-seed cake and cotton meal, and palm-nut cake and meal; oils, viz.: cocoanut and palm in their natural state, ottar or attar of roses and oil of roses; blood albumen, tannic acid, antimony salts, tartar emetic, and grey tartar, when imported by manufacturers for use in their factories only; chlorate of potash in crystals, when imported for manufacturing purposes only; esparto, or Spanish grass, and other grasses, and pulp of, for the manufacture of paper; felt, adhesive, for sheathing vessels; fire-bricks for use exclusively in processes of manufactures; salt imported from the United Kingdom or any British possession, or imported for the use of the sea or gulf fisheries, not otherwise provided for; platinum wire, and retorts, pans, condensors, tubing, and pipe made of platinum, when imported by manufacturers of sulphuric acid for use in their works in the manufacture or concentration of sulphuric acid.

DYE-WOODS AND THEIR EXTRACTS.

By A. Raynaud.

I HAVE never observed, in publications concerning the analysis of dye-woods and their extracts, any mention of an adulteration which I have met with in the course of an examination of logwood extracts supplied to yarn dyers. The practice I refer to is that of adding violet aniline colours to strengthen the feeble colour of the extract. This falsification can easily be detected. Cotton dyed in such a solution tends to lose its colour when a drop of diluted potash solution is added, whilst the colour is changed to violet or brightened by the careful addition of a dilute acid.

Under the same conditions, genuine logwood becomes dark and changes to violet in an alkaline solution, and takes an orange red colour when an acid is added.

The falsified extract, compared with a specially prepared genuine extract, differs from the latter in being soft and sticky to the touch, and dull in appearance, instead of being clear and bright. When both were heated on a stone for several hours, the first dried up with difficulty, a crust being simply formed round the edge and the interior remaining soft; the normal extract did not present this phenomenon.

In this particular case it was possible to obtain an indication of the colour which had been added, by observing the effect of various colouring matters on the normal extract, and to make up an extract resembling the falsified one.

The two extracts treated with ether yielded solutions of similar depth of tint, which absorbed 75% at the colorimeter. It was therefore concluded that the extract contained 20-25% of logwood, the remainder being a foreign extract (chestnut), molasses, earthy matters, and an aniline compound. It was subsequently ascertained that the manufacturer of the extract acknowledged having only employed about ¼ of logwood. Various experiments made on logwood extracts purchased from various firms lead us to conclude that most of them are falsified with chestnut extract, varying in amount from 10 to 50 per cent. The addition of aniline colours is equally frequent.—*Moniteur de la teinture.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

Cui Bono.—Write to your local M.P.; we cannot advise you.

Pollution.—The whole subject is dealt with in "The River Irwell, and its Tributaries."

P.J.S.—Try the Redonda Phosphate.

M.H.—Principally arsenic in glycerine; other substitutes have been tried.

H.M.R.—You should get one for about 5s.

G.G.B.—No space at present.

H. McN.—We do not expect *all* our readers to agree with the views expressed in our columns; if you will somewhat modify your letter; we will insert it.

B.G.H.—We cannot accept your letter as a news item; it may do for the marines. We really have to be very careful as to what we accept as news. We welcome all duly authenticated contributions.

We do not hold ourselves responsible for the opinions expressed by our correspondents.

THE DIFFUSION OF POISONS.

To the Editor of the Chemical Trade Journal.

Sir,—A few weeks ago we noticed in your valuable paper an article on "The Diffusion of Poisons," in which the writer refers to the Ardwick poisoning case and to the evidence of one of the witnesses, who said—"That it often made her hands and face sore after handling the tubs." The writer of your article evidently concludes from this statement that the empty arsenic packages were allowed to leave our works without being washed, and we think it necessary to point out that such is not the case, as every keg is thoroughly cleaned before it leaves the place. The witness above referred to, who bought the kegs, never took them away unwashed, but she was several times allowed to assist our man in doing so when she was anxious to take more away than we had ready for her. The same witness distinctly told us that the soreness of her hands and face was due to the washing of the tubs at our works, but that she never observed any evil effects from handling these kegs after they had left our premises. While agreeing with the tendency of your article, we would thank you to publish the above explanation of the evidence given by the witness quoted.—We remain, &c., yours respectfully, H. Kupferberg & Co.

Yew Tree Chemical Works, Manchester,
November 18, 1890.

NOTICE.

WE have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the next lecture, on "River Pollution," the chair will be taken by F. H. Walmsley, Esq. Chairman of the Rivers Committee of the Salford Corporation.

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

Trade Notes.

THE UNITED ALKALI COMPANY, LIMITED.—As we go to press, we learn that the Alkali Union shares are practically subscribed, and now being allotted. None will be offered to the outside public.

PULSOMETER ENGINEERING COMPANY, LIMITED.—We understand that the Pulsometer Engineering Co. are specially busy with their patent machinery for filtering river or canal water, having now in hand orders for plants equal to 2,400,000 gallons of muddy water per 24 hours. A portion of this is a repetition order from a foreign water works, where the machines have been most successful.

THE AFFAIRS OF J. M. KIRK AND SONS, DYERS, OF HALIFAX.—The Official Receiver at Halifax (Mr. Thomas England) has issued a statement of affairs in this bankruptcy. It shows unsecured liabilities £30,513. 4s. 11d., and assets estimated at £24,263. 3s. 5d, leaving a deficiency of £6,250. 1s. 6d. The Official Receiver has the following among other observations: "The freeholds, which appeared in the last balance sheet at £32,921. 11s. 6d., have been put down at £19,752. The statement filed by the debtors is based on the business being sold as a going concern. The total unsecured liabilities in a second statement are £37,585. 9s. 1d., and assets (the machinery and plant being reduced by 50 per cent. instead of 25 per cent.) £19,191. 9s. 11d., or a deficiency of £18,393. 19s. 2d., instead of £6,250. 1s. 6d., as in the summary now issued." "The total loss during the firm's trading (a period of twelve years) has been £77,000., or an average loss of over £6,000. per annum. The firm commenced with a capital of about £36,000., the freeholds being then valued at £30,811., and the working plant at £5,598. Nothing whatever during the whole period of trading has been written off the freeholds by way of depreciation, and they appear to-day in the books as an asset of £32,921. With reference to the machinery and plant, which now stand in the books as an asset of £24,020., no depreciation has been written off from first to last; but I am informed that nearly the whole of the plant has been renewed during that period, and additions made which have been charged to revenue. The continual loss in trading must have caused the firm to suspend payment long ago if fresh working capital had not been introduced. Mr. Henry John Percy Kirk, when he joined the firm, contributed £22,000. in 1881 and 1882, and considerable sums of money were also lent by Mr. J. M. Kirk and Mr. H. J. P. Kirk to the firm."

SHOCKING AFFAIR AT GOLBORNE GASWORKS.—The adjourned inquiry into the circumstances attending the death of Mr. Jno. Hincks (manager) and Mr. Adam Glover (farmer), in connection with the accident at Golborne Gasworks, was held at the Victoria Hotel, Golborne, on Monday afternoon, before Mr. Coroner Brighouse. Thos. Widdows, an employé of the gas company, said he was with Mr. Hincks at the time of the accident. The latter was attempting to screw up a pipe in the ammonia tank, which is elevated, and which is reached by means of a temporary ladder. Hincks had put a box in the tank to stand upon, having taken the cover off. There was a very strong smell, and almost immediately Hincks said "The gas is overpowering me." He was then hanging with his head over the side of the tank. Witness held on to him until he was himself overpowered and fell headlong into the room below, Hincks falling back into the tank. By the Coroner: Hincks, as manager, did not require permission to go to the tank. He had attended to the pipe once before, and witness considered he could have reached it without getting into the tank and with more safety by removing only a portion of the cover and lying on the remaining boards. Evidence having been given as to Mr. Glover being called to the rescue and jumping into the tank to save Mr. Hincks, Dr. Dobb stated that when he reached the tank both men were lying at the bottom quite dead, having been poisoned by inhaling carbonic acid gas and ammonia. He had to direct his attention to the rescuers, who were suffering from the effects of the fumes. The jury returned the following verdict: "That both men were accidentally suffocated, but that their lives might have been saved if there had been ventilation and better access to the tank."

ACTION FOR ALLEGED BRIBERY.—The case of Lister and Co., Limited, and another *v.* Thompson and Co., last week came before Justices Mathew and Grantham. This was an appeal by the plaintiffs from an order of Mr. Baron Huddleston at Chambers directing him to give further particulars as to the cause of action. Mr. F. Lockwood, Q.C., M.P., and Mr. Gould were counsel for the plaintiffs in support of the appeal; Mr. Leese appeared for the defendants, and opposed the appeal. Mr. Lockwood said, in supporting the appeal, that the action was brought by Messrs. Lister and Co., Limited, of Bradford, a well-known firm of dyers, against the defendants, a firm of drysalters, of Manchester, to recover damages in respect of bribes and commissions alleged to have been paid by the defendants to the employés of the plaintiffs. The allegation was that the defendants corruptly obtained orders of the plaintiffs by secretly paying or promising the plaintiffs' manager or foreman commissions, presents, or bribes. It was further alleged that the prices charged by the plaintiffs were in all cases in excess of their reasonable and proper prices by at least the amount of the bribes, and in excess of the market or current prices.—Mr. Leese, in opposing the appeal, contended that the defendants were entitled to have further particulars of the allegations of bribery which were brought against them, and they wanted to know the dates on which these bribes were alleged to have been given. Mr. Justice Mathew, in giving judgment dismissing the appeal, said the plaintiffs suggested that they knew of specific instances of bribery on which they might rely at the trial. If they knew of those cases they ought to give the defendants such information as would enable the defendants to meet these instances. If the plaintiffs did not know of specific cases of bribery they should say so in plain terms. Mr. Justice Grantham concurred, and the appeal was dismissed with costs.

Market Reports.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There is a good all round demand for chemicals, bleaching powder in particular being in brisk request, and prices for remainder of this year have to-day been raised 12s. 6d. per ton for softwood casks, and 15s. per ton for hardwood casks. Recovered sulphur has also been put up 5s. per ton. Other articles remain unchanged.

So far as can be gathered from reliable sources, the applications for shares in the United Alkali Co., Ltd., have been so numerous, that the floating of the company is now assured. It is said that, for the present, the general public will not be asked to subscribe for shares.

The following are the market quotations for November—December deliveries:

Bleaching powder, in softwood casks, £6. 15s. 0d. per ton; in hardwood casks, £7. per ton, both less 3½%. Caustic soda 77%, solid, in drums, £12. 5s. per ton, nett; ground and packed in 3-4 cwt. barrels, £16. per ton, nett; 70%, £11. 10s. per ton, less 3½%; soda ash, 48/52%, 1⅜d. per degree less, 3½%; white alkali, 1⅜d. per degree, less 5%; soda crystals, 56s. per ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; and ground, in casks 53s. per ton, both less 3½%; recovered sulphur, packed in 2 cwt. bags, £4. 15s. per ton, nett; chlorate of potash, 5½d. per lb., less 5%; silicate of soda, 75° Tw., £2. 10s. per ton; 100° Tw., £3. 7s. 6d. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. per ton; in 5-7 cwt. casks, £5. 10s. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

The market for Northumberland small coals is very quiet, and prices vary a good deal according to quality, 5s. to 6s. per ton, delivered into craft represents current prices. Durham small is very steady, at prices ranging from 6s. 6d. to 7s. 6d. per ton.

TAR AND AMMONIA PRODUCTS.

The Benzol market is very irregular. Small transactions for early delivery have taken plaee at about 4s. 9d. for 90's, and 3s. 7d. for 50/90's. Next year's delivery can be bought at under the foregoing prices, say about 4s. 6d. and 3s. 6d. Most other tar products remain in *statu quo*. Anthracene is steady; 1s. 5d. being obtainable for 30% A, and 1s. 1¼d. for 30% B. Pitch is a trifle firmer.

The sulphate of ammonia market is very weak and to-day's prices may be quoted as follows: Hull £10. 15, while Becton make has been reduced to the same figure. £11 is now asked for London outside makes, while £10. 15s. is being quoted as to-day's price. At Leith the outlook is rather gloomy, but many makers are declining to sell at these prices.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron fell 1s. 4d. to 1s. 6d. Scotch warrants closed at 48s. 6d. cash and 48s. 10d. one month. Middlesbrough, 45s. 1d. cash; hematite, 55s. 6d., cash. Copper fell, £1. 15s. Chili bars, G.O.B.'s and G.M.B.'s closed at £53. 17s. 6d. to £54. 5s. cash, and £54. to £54. 7s. 6d. three months. Tin declined £1. Straits closed at £89. 10s. to £90. cash, and £90. 7s. 6d. to £95. 17s. 6d. three months; Settlement price £89. 10s. English ingots, £93. 10s. to £94. Lead: Spanish, £13. 10s.; English, £13. 15s. to £14. Silesian Spelter: ordinary, £24. to £24. 2s. 6d. Quicksilver, first hands, £10.; second hands, £9. 12s. 6d. Copper shares weak, owing to the fall in the price of copper; Cape fell 4⅝ to 4 1/16; Copiapo, 2¾ to 2⅝; Libiola, 2⅝ to 2 5/16; Mason and Barry, 6⅝ to 6⅜; Namaqua, 2½ to 2 7/16; Panulcillo, 1 1/16 to ⅞; Rio Tinto, 1/16 to 22⅜; Tharsis, ⅛ to 5⅝.

GLASGOW, WEDNESDAY.—Market weak; closing above the worst; large business. Scotch done at 48s. 7½d., 48s., and 48s. 7½d. cash, also at 48s. 9d., 48s. 4d., and 48s. 11d. one month; closing buyers at 48s. 7d. cash, sellers ask ½d. more. Middlesbrough done at 44s. 9d. to 45s. 3d. cash, closing buyers at 45s. 1½d. cash, sellers ask 45s. 3d. Hematite done at 55s. 3d. to 55s. 6d., cash., also at 55s. 6d. to 55s. 9d. one month; closing buyers at 55s. 6d. cash, sellers ask 55s. 7½d.

WOLVERHAMPTON, WEDNESDAY.—The collapse in the Glasgow warrant market owing to the unsettled financial position intensified the uneasiness which was this afternoon felt here from the same cause, and business was decidedly dull. Quotations for pig iron were lower than last week, both for Staffordshire sorts and for outside brands. Cinder pigs were quoted 45s. 6d., and Northamptons and Derbyshires about 47s. Finished iron quotations were fairly well maintained at £8. 10s. for marked bars, and £6. 5s. for common sheets. Doubles were £8.

THE COPPER MARKET.

Messrs. Harrington and Company's copper report, dated Liverpool, 18th November, 1890, states:—Chili copper charters for first half of November are advised as 1,300 tons. Exchange 22 7/16d. The total charters since 1st January are 23,100 tons, against 19,800 tons for same time last year.

Since our last, we have had a falling market for G.M.B.'s and G.O.B.'s, owing to rumours regarding financial difficulties; and the rise in Bank Rate, with persistent heavy selling, has also tended to depress prices, which receded from £58. 5s. cash and £58. 7s, 6d. three months to £56. and £56. 5s. respectively; but on the 11th and 12th there was a reaction, and we improved to £57. cash and £57. 10s. three months, since when the market has again declined, and, notwithstanding moderate charters and good figures for the fortnight, prices, yesterday, touched £55. 12s. 6d. cash, and £55. 15s. three months, and to-day we close at £55. 12s. 6d. and £56. respectively.

The total decrease for the fortnight in the Liverpool, Swansea, London, and Havre stocks is 2,125 tons.

The present stock of English G.M.B.'s in warehouse is 3,524 tons, against 4,034 tons on the 31st ult., 60 tons having gone into Swansea stock, and the deliveries in Liverpool and Swansea were 507 tons, thus showing a decrease of 510 tons for the fortnight.

Refined and manufactured sorts are dull at £60. 10s. to £61. 10s. for tough, £63. 10s. to £64. 10s. for best selected, £65. to £66. for India sheets, £69. to £70. for strong sheets, and 6¼d. to 6½d. for yellow metal sheets.

The sales of furnace material comprise at Liverpool—93 tons Spanish precipitate, at 12s. to 12s. 3d.; 13 tons Peruvian ore, at 10s. 6d.; 300 tons argentiferous Montana matte, December shipment, on private terms; 65 tons Alosno precipitate, 45%, 10s. 9d.; 50 tons Alosno precipitate, 85%, at 11s. 9d.; and 40 tons Spanish matte, low produce, at 10s. 6d. per unit.

MISCELLANEOUS CHEMICAL MARKET.

Alkali manufacturers continue busy in all departments, and are well booked with orders ahead. Under these conditions prices all round are steady or tending upwards. Bleaching powder is firm at £6. 12s. 6d. per ton on rails for prompt and forward deliveries. Salt-cake, soda ash, soda crystals, and caustic soda are holding well together, there being ample demand to carry off all supplies. It is probable that the relative values of these products will for the future be maintained within reasonable limits, and the disproportions in value, which have sometimes existed in the past, will to a large extent be avoided now that the works are under a central control. The quotation for soda ash of ordinary qualities is 1⅜ per degree, and for refined ash 1½ per degree. White caustic soda 70% £11. 10s. f.o.b.; 60% £10. 10s. Soda crystals £3. 10s. per ton nett weights. Bicarbonate of soda £7. per ton. Recovered sulphur is selling freely for forward delivery; the output for the present year is freely sold. Vitriol is in strong demand. Muriatic acid in the chief centres of production, 9d. to 10d. per carboy at makers' works. Chlorate of potash is receiving more attention at 5⅜ to 5½ per lb. Sulphate of copper is more enquired for for forward delivery, and prices are £18. 15s. to £19. 5s. per ton for January-March f.o.b. Acetate of lime (brown) is firm on the spot at £7. 15s. to £8. per ton; grey steady at £13. per ton. Acetate of soda firmer, under curtailed production. Acetic acids without change on the spot. Potash, caustic, and carbonate still scarce, and prices firm. Carbolic acid continues weak. Aniline salt and aniline oil are steadily maintained in price, makers' being well sold. Lead acetate in better demand. Nitrate of lead dull. Zinc salts firmer.

REPORT ON MANURE MATERIAL.

The market during the past week has again been very quiet, and there is no business of importance to report either in phosphatic or nitrogenous material.

Prices for mineral phosphates are unchanged. The attitude of buyers is decidedly to look on at present, and some material concession in prices would have to be made in order to induce any considerable purchases.

Several cargoes of River plate bones are now on the market, and £5. 7s. 6d. is asked, delivered good to U.K. ports, but £5. 5s. is probably nearest value. East Indian bone meal remains at £5. 7s. 6d. per ton, ex quay, for fair average quality, for shipment, though £5. 5s. has been accepted in several instances for quality, barely fair average, arrived. The price for East Indian crushed bones remains £5. 5. to £5. 7s. 6d. per ton, according to position, delivered ex quay, Liverpool. Common grinding bones are in much request for charring purposes, and £5. 7s. 6d. has been paid for a good lot of Brazils, ex quay, Liverpool. There are sellers of cargoes of River plate bone ash at £5. 7s. 6d. per ton, nett, Hamburg terms, but this price is not now obtainable.

Nitrate of soda is exceedingly dull, and 7s. 9d. is now the price for ordinary quality, 8s. for refined, on spot. Due cargoes are not worth over 7s. 9d., and 8s. would be outside value of October-November shipments.

There is nothing fresh reported in dried blood or in River plate guanos, and superphosphates remain quiet but firm at last prices quoted.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

All over the week the course of sulphate of ammonia has continued downwards, and at the time of writing the force of the fall seems by no means spent. Up to Saturday, makers, with an appearance of firmness, refused to have anything to say to £11., the price at which buyers were agreeable to act; but by yesterday they had given way, and that money was taken more than once. This is the value to-day, but it is right to note also that one or two of the makers are still holding for an eighth or a sixteenth higher. The unwontedly low price for nitrate of soda is of course the principal cause of the sulphate downfall, and this the makers now peforce admit. The paraffin section of the market is perhaps a shade easier, in sympathy with reports from America of lowering pertroleum values; but, except in burning oil, there is nothing in the shape of weakness as yet. Paraffin scale and paraffin wax, both retaining late values. In the general chemicals market firmness prevails, and buyers are inclined still further to direct themselves to the necessities of the forward supply. The prices of

bichromates and conditions are unchanged, but makers complain of great slackness. Bichromate of potash sales have been very scarce for the week, while of soda there are hardly any. Chief prices current are: Soda crystals, 56s. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 2½%, Tyne; caustic soda, white, 76°, £13. 10s., 70/72°, £11. 10s., 60/62°, £10. 5s., and cream, 60/62°, £9. 17s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £7., and 1 cwt. casks, £7. 5s., net Tyne; refined alkali, 48/52°, 1⅜d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £6. to £6. 15s., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5⅜d., less 5% any port; nitrate of soda 7s. 10½d. to 8s.; sulphate of ammonia, £11. f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18. 10s, less 5% Liverpool; paraffin scale, hard and soft, 2¾d. per lb; paraffin wax, 120°, semi-refined, 3⅜d. to 3¾d.; paraffin spirit (naphtha,) 8d. a gallon; paraffin oil (burning), 6d. to 6¼d at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 5s. to £6. 10s., and 890/895°, £7. 10s. to £8. Week's imports of sugar at Greenock, were 36,000 bags.

THE LIVERPOOL MINERAL MARKET.

There has been a brisk demand all round, and prices have somewhat strengthened during the week. Manganese: Arrivals have been somewhat smaller. They have, however, all gone into consumption; stocks are further reduced, and prices are firmer. Magnesite: Sales very slow. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £12. 10s. Bauxite (Irish Hill brand): Owing to the deodorising and other new processes requiring sulphate of ammonia the demand has considerably increased, and the present production is scarcely able to keep pace therewith; lump, 22s.; seconds 18s.; thirds, 14s.; ground, 35s. French chalk: Arrivals are very much below the average. The demand has been very good, and large sales have been made, reducing stocks considerably, especially G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate quieter; sulphate: prices for best qualities firmer; "Angel White," No. 1, 70s; No. 2, 60s to 65s; No. 3, 45s. Pumicestone: Lump unaltered; ground easier. Iron ore of all classes continues in fair demand; manganiferous in request, and prices firm. Santander, 9s. to 10s. 6d., f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Emerystone: The demand for best brands continues at full prices. No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal brisk, at full prices. Chrome ore: High grades continue in request, and prices are stronger. Antimony ore and metal sought for at last prices. Asbestos in strong demand, especially Canadian rock. Potter's lead ore: "standard" brands improving in figure; smalls, £13 to £14.; selected lump, £15. to £16. Calamine: Good qualities in demand at advanced prices. Strontia sulphate (celestine) inquired for, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar steady; English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, quieter. Plumbago firm; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, 20s. to 22s. 6d. Ground mica, £50. China clay easier; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), inquired for, finest quality 22s.

THE LIVERPOOL COLOUR MARKET

Colours continue without change in prices. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire: common, 40s, medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish. Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt, Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

New Companies.

Alkali and Sulphur Company, Limited.—This company was registered on the 11th inst., with a capital of £60,000., in £10. shares, to purchase and work certain patents and inventions belonging to Edward Wm. Parnell, J. Simpson, and J. Leith, for improvements in the manufacture of alkali, sulphur, and other chemicals. The subscribers are:—

	Shares.
Wm. Bennett, 208, Lodge-lane, Liverpool	1
J. Briscoe, Trefnuel, Denbigh	1
R. J. Glasgow, India-buildings, Liverpool, merchant	1
A. A. Guild, Old Castle-buildings, Liverpool, merchant	1
H. J. Houghton, 26, North John-street, Liverpool	1
J. Simpson, 8a, Rumford-place, Liverpool, merchant	1
J. Firth, St. Helens, alkali manufacturer	1

Bowman's Oxygen Lighting Company, Limited.—This company was registered on the 12th inst., with a capital of £125,000., in £1. shares, to acquire the patent rights of Robt. Davy Bowman for lighting by combining oxygen with gas or oil, also for the purification of gas and air, for bleaching, and for aeration of table water. The subscribers are:—

	Shares.
J. T. Robinson, 7, John-street, Adelphi, surveyor	1
H. Hughes, 23, Martin's-lane, solicitor	1
G. H Hogan, Park-lane, Croydon, solicitor	1
W. Paterson, Burleigh House, Fortune-green, publisher	1
H. J. Anderson, 49, Queen Victoria-street merchant	1
R. Sandys, 13, Cornwall-mansions, Regent's-park	1
C. H McEuen, 97, Cannon-street, merchant	1

Incorporated Gas Institute.—This company was registered on the 11th inst., as a company limited by guarantee to £1. each member, to promote the advancement of gas engineering, manufacture, and finance; and to facilitate the interchange of information amongst its members, and the publication and communication of information upon such subjects. Under licence from the Board of Trade, granted pursuant to section 23 of the Companies' Act, 1867, the word limited is omitted from the title. The president of the society is Mr. Joseph Hepworth, of the Gas Works, Carlisle, and the secretary is Mr. W. H. Harvey, 3, Victoria-street, Westminster.

Zynkara Company, Limited.—This company was registered on the 7th inst., with a capital of £3,000., in £1. shares, to acquire the business of manufacturers of, and dealers in, fluid for the prevention of corrosion, and fitting in steam boilers, carried on by John Bradborne Dodds, John Reed Fothergill, and Edmund Francis Dodds, at Newcastle-on-Tyne, under style of the Zynkara Company. The subscribers are:—

	Shares.
J. B. Dodds, Newcastle, chemist	1
J. R. Fothergill, West Hartlepool, ship surveyor	1
E. F. Dodds, Whitby, merchant	1
M. Fothergill, West Hartlepool	1
M. L. Dodds, Gosforth, Newcastle	1
A. Shepherd, Sunderland, accountant	1
A. Dodds, Whitby	1

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Gas Fires. H Darwin. 17,570. Nov. 3.
Kilns for Fire-bricks and the like.—(Complete Specification). J. Dunnachie. 17,573. Nov. 3.
Manufacture of White Lead—G. Chapman. 17,597. Nov. 3.
Electric Switches. A. C. Lainchbury. 17,600. Nov. 3.
Centrifugal Fans.—(Complete Specification.) C. Wenner. 17,607. Nov. 3.
Fluid Pressure Reducing Valves. A. Horne. 17,609. Nov. 3.
Steel and Invert Iron.—(Complete Specification). P. M. Justice. 17,613. Nov. 3.
Improved Process of Case Hardening. H. Grafton. 17,621. Nov. 3.
Manufacture of Metallic Nickel and Iron and Nickel Alloys. J. Garnier. 17,623. Nov. 3.
Treatment of Linseed Oil. C. Morfit. 17,624. Nov. 3.
Furnaces for Copper Smelting. B. Richards. 17,625. Nov 3.
Feed Water Heaters. E. Bairstow. 17,655. Nov. 4.
Sectional Steam Boilers—(Complete Specification.) W. Fairweather. 17,673. Nov. 4.
Printing with Primuline. E. W. Foxlee. 17,694. Nov. 4.
Apparatus for Feeding Gas Producers. C. J. Copeland. 17,702. Nov. 4.
Coal Retorts. W. Wren. 17,710. Nov. 4.
New Derivatives of Alizarine. B. Willcox. 17,712. Nov. 4.
Brick-Moulding Machinery. S. Eddington. 17,715. Nov. 4.
Distilling and Condensing Apparatus.—(Complete Specification.) H. H. Lake. 17,718. Nov. 4.
Gas Retort Settings. T. Cooke. 17,745. Nov. 5.
Sulphuretted Hydrogen in the Manufacture of Alkali. J. Simpson. 17,765. Nov. 5.

Construction of Dye Vats. T. F. Naylor and A. Naylor. 17,769. Nov. 5.
Steam Generator Furnaces. J. Hulton. 17,770. Nov. 5.
Mechanical Stokers. J. Hodgkinson. 17,779. Nov. 5.
Steam Generators. J. I. Thornycroft. 17,809. Nov. 5.
Improved Farinaceous Product. T. S. Lemon and E. B. Phelps. 17,811. Nov. 5.
Reverberatory Furnaces. F. Ellershausen. 17,815. Nov. 5.
Hydro-extractors. V. A. Prost. 17,819. Nov. 5.
Retorts. R. R. Gubbins. 17,820. Nov. 5.
Automatic Continuous Magnesium Light.—(Complete Specification.) M. E. Bangor. 17,821. Nov. 6.
Low Water Alarms for Steam Boilers.—(Complete Specification.) E. G. Constantine. 17,826. Nov 6.
Liquor Regulating Supply Apparatus. J. J. Meldrum and T. F. Meldrum. 17,831. Nov. 6.
Sodium Bichromates. S. A. Sadler. 17,836. Nov. 6.
Mechanical Stokers. W. Fraser. 17,838. Nov. 6.
Steam Traps. J. J. Royle. 17,841. Nov. 6.
Steam Boiler Furnaces. J. F. Rankin and M. Rankin. 17,844. Nov. 6.
Improved Glue Compound.—(Complete Specification.) T. O. Butler. 17,853. Nov. 6.
Salt Pan Furnaces. W. Blagg. 17,855. Nov. 6.
Pumping Apparatus.—(Complete Specification.) J. Wright. 17,859. Nov. 6.
Production of Dyed Cotton Yarns.—(Complete Specification.) T. Salzmann. 17,872. Nov. 6.
Machine for Charging Gas Retorts.—(Complete Specification.) C. Eitle. 17,921. Nov. 7.
Dynamo Armatures. B. Rejchman. 17,929. Nov. 7.
Treatment of Metallic Ores. N. Lébédeff. 17,935. Nov. 7.
Apparatus for Distilling Sea and other Water. A. Normandy. 17,939. Nov. 6.
Disinfectants and Deodorisers. J. A. Phillips. 17,943. Nov. 7.
Gas Stoves. W. Henry. 17,945. Nov. 7.
Storage Batteries. H. L. Maugras. 17,954. Nov. 7.
Charring or Drying Retorts. J. Donald. 17,970. Nov. 7.
Production of Vegetable Textile Fibres.—(Complete Specification.) A. J. Boult. 18,018. Nov. 8.
Manufacture of periodides of isobutyl phenols and of isobutyl cresols. B. Willcox. 18,021. Nov. 8.
Manufacture of Methyl and Ethyl-phenacetin. B. Willcox. 18,022. Nov. 8.
Production of a Novel Pynazolon. O. Imray. 18,024. Nov. 8.
Production of Sodium Formylphenylhydrazine and of Symmetric Alkylphenylhydrazine. O. Imray. 18,025 Nov. 8.
Machinery for Pulverising Ore and for Extracting Gold and Silver. T. R. Jordan and E. Jones. 18,028. Nov. 8.
Electric Switch.—(Complete Specification.) G. F. Redfern. 18,034. Nov. 8.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

R. Ockleston, C. D. Ockleston, and T. S. Ockleston, under the style of R. Ockleston, Mill Bank Paper Mills, near Manchester, paper manufacturers.

Calthrop and Montgomery, Liverpool, manure merchants.

H. A. and F. Swann Bros., Cambridge and elsewhere. lime burners, brewers, and maltsters.

F. J. Holbrook, and J. Jones, under the style of the Warmly Brick and Tile Co., Warmley and Clutton Hill, near Bristol, brick and tile manufacturers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

Campbell, Neil, Edward (trading as Campbell and Co.), late of Holloway Road, and Arthur Road, Holloway, London, mineral water manufacturer.

Kirk, Joseph Moxon, Halifax, and Kirk, Henry John Percy, Parkstone, trading as J. M. Kirk and Sons, Halifax, dyers and finishers.

Stephens, George Edward, Neyland, chemist and druggist.

Adjudications.

Simmons, Arthur, Bristol, oil and colourman.

Orders made on Applications for Discharge.

Tobias, Henry Ashur, Liverpool, chemical broker, trading with A. J. Tobias, as Tobias and Co., discharge refused.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending November 8th.

Antimony Ore—

France,	42 t.	H. R. Merton & Co.
Sydney,	13	Bank of N. S. W.
France,	12	Holme & Co.

Acetate of Lime—

U. S.,	466 pks.	Johnson & Hooper

Acetic Acid—

Holland,	36 pks.	A. & M. Zimmermann
Belgium,	9	W. W. & R. Johnson & Sons
Holland,	50	Beresford & Co.

Barytes—

Germany,	23 cks.	O'Hara & Hoar
,,	19	H. A. Litchfield & Co.
Holland,	22	W. Harrison & Co.
Belgium,	317 pks.	A. Lumbeck & Co.
,,	26 cks.	Leach & Co.
Germany,	12	O'Hara & Hoar
,,	19	L. & I. D. Jt. Co.

Borax—

Germany,	£28	F. Stahlschmidt & Co.

Boracic Acid—

Italy,	35 pks.	Howards & Son

Barytes Nitrate—

Germany,	£50	H. Lambert

Barium Chloride—

Germany,	£40	Petri Bros.

Brimstone—

France,	2 t.	R. Morrison & Co.
,,	4	Mosenthalsons & Co.
,,	3	L. & I. D. Jt. Co.

Bones—

E. London,	30 t.	A. & W. Nesbitt
Cyprus,	15	Goad, Rigg & Co.
E. Indies,	351	Gonne, Croft & Co.
U. S.,	22	Hicks, Nash & Co.

Copper Ore—

Spain,	6 t.	Retty, Wood & Co.

Cream of Tartar—

France,	5 pks.	C. F. Gerhardt
,,	4	B. & F. Wf. Co Ltd.
Italy,	20	L. & I. D. Jt. Co.
France,	3	Hyslop & Symonds

Caoutchouc—

Madagascar,	39 c.	Prop. Bull Wf.
Zanzibar,	20	W. M. Smith & Sons
Madagascar,	21	,,
Zanzibar,	79	Anderson, Weber & Smith

Caoutchouc—*continued.*

E Indies,	2 c	H. Kiver & Co.
Colon,	2	L. & I. D. Jt. Co.
France,	110	Hoare, Wilson & Co.
Singapore,	223	Huttenbach & Co.
E. Indies,	30	L. & I. D Jt. Co.
Zanzibar,	30	,,
U. S.,	6	L. P. D. Co.
Manila,	134	Borneo Co., Ltd.
Zanzibar,	72	Clarke & Smith
,,	246	L. & I. D. Jt. Co.
France,	6	W. M. Smith & Sons
,,	3	Hoare, Wilson & Co.
,,	2	Anderson, Weber & Smith
Singapore,	132	L. & I. D. Jt. Co.
Guayaquil,	80	M. Goyeneche & Co.

Chemicals (*otherwise undescribed*)

Holland,	10 pks.	Phillipps & Graves
Germany,	274	T. H. Lee
,,	252	A. & M. Zimmermann
,,	£26	T. H. Lee
,,	36	W. Burton & Sons
Holland,	15	Barr, Moering & Co.
,,	35	A. & M. Zimmermann
Germany,	505	,,
,,	9	T. H. Lee

Dyestuffs—

Madders

Holland,	7 pks.	Williams, Torrey & Co.

Sandal

Singapore,	9 t.	Lambert & Strong
E. Indies,	7	Walker, Memsie & Co.
,,	30	A. Everingham & Co.
,,	7	W. J. Bush & Co.

Gambier

Singapore,	765 pks.	W. H. Cole & Co.
,,	1,038	L. & I. D. Jt. Co.
,,	168	P. & S. Evans & Co.
,,	833	Adamson, Gilfillan & Co.
,,	413	Cox, Paterson & Co.
,,	448	L. & I. D. Jt. Co.
,,	216	W. Perry & Son
,,	480	L. & I. D. Jt. Co.
,,	1,691	R. & J. Henderson
,,	220	Beresford & Co.
,,	84	H. Lambert
Germany,	233	Van de Meden & Co.

Argols

Italy,	324 pks.	Thames S. T. Co.

Myrabolams

E. Indies,	1,309 pks.	Hoare, Wilson & Co.
,,	91	L. & I. D. Jt. Co.

Gutch

E. Indies,	250 pks.	Anderson Weber & Smith
,,	20	A. Hughes

Sumac

Italy,	100 pks.	Baxter & Hoare
,,	600	J. Kitchin, Ld.
,,	50	J. Knill & Co.
,,	500	W. Shelcott
,,	100	Vokins & Co., Ld.
Cyprus,	10	Knowles & Foster

Tanners' Bark

Belgium,	50 t.	Fardell & Co.

Indigo

Holland,	8 chts.	L. & I. D. Jt. Co.
,,	2	Dipnall & Oxford
Belgium,	1	L. & I D Jt. Co.
E. Indies,	10	,,
,,	26	Arbuthnot, Latham & Co.
,,	10	Benecke, Souchay & Co.
,,	161	W. Brandt, Sons & Co.
,,	7	L. Achard & Co.
Germany,	4	J. Barber & Co.
,,	1	Phillipps & Graves

Annatto

France,	2 pks.	Skilbeck Bros.

Extracts

U. S.,	40 pks.	W. A. Bowditch
,,	25	L. J. Levinstein & Sons
France,	20	,,
Germany,	71	A. J. Humphrey
Belgium,	90	Leach & Co.
,,	90	L. J. Levinstein & Sons
France,	385	A. J. Humphrey
,,	80	Props. Chmbln's Wf.

Glucose—

Germany,	10 pks. 80 cwts.	T. M. Duche & Sons
Holland,	401 880	R. G. Hall & Co.
France,	100 100	C. A. H. Nichols
,,	30 110	Carey & Sons
,,	200 200	L. N. Norman & Co.
,,	200 200	Barrett, Tagant & Co.
U. S.,	900 900	,,
,,	40 226	M. D. Co.
,,	1,000 1,000	T. C. Howell
Germany,	33 270	Prop's. Chamblin's Wf.
France,	100 100	J. Barber & Co.
U. S.,	300 1,784	L. Sutro & Co.
Germany,	200 200	J. Barber & Co.
U. S.,	1,000 1,000	Union Ltge Co., Ld.

Glucose—*continued.*

,,	40 220	C. Southwell & Co.
Germany,	88 84	J. Knill & Co.
,,	25 235	J. H. Epstein
,,	40 80	M. D. Co
,,	25 220	Fellows, Morton & Co.
,,	18 145	Pillow, Jones & Co.
Holland,	50 50	J. Barber & Co.
U. S.,	40 225	J. Keiller & Co.
,,	220 1,200	T. M. Duche & Son
,,	30 180	Props. Scott's Wf.

Glycerine—

Holland,	£1,000	Spies Bros & Co.
Germany,	184	T. H. Lee
Holland,	65	G. Rahn & Co.

Gutta Percha—

Holland,	20 c.	J. Parlevliet
Singapore,	349	Soundy & Son
,,	315	Huttenbach & Co
,,	860	H. W. Jewesbury & Co.

Guano—

S. Pacific,	700 t.	Anglo-Contl. Guano Wks.
,,	700	,,

Isinglass—

Hudson's Bay,	2 pks.	Hudson's Bay Co.
Singapore,	6	L. & I. D. Jt. Co.
E. Indies,	8	J. P. Alpe & Co.
U. S.,	7	W. M. Smith & Sons

Manure—

Holland,	60 t.	D. de Pass & Co.
France,	185	Anglo-Contl. Guano Wks.
,,	140	London Manure Co., Ld.
Montreal,	400	Couper, Millar & Co.
U. S.,	100	McDougall & Bouthron
,,	3	C. A. & H. Nichols

Phosphate Rock

Montreal,	257 t.	Couper, Millar & Co.
Belgium,	400	Potter Bros.

Magnesia—

Holland,	£135	Beresford & Co.

Nitre—

Germany,	20 cks.	Craven & Co.
Pisagua,	6,125 bgs.	W. Montgomery & Co.

Naphtha—

Holland,	2 drs.	Stein Bros.
Belgium,	13	,,

Nickel Salts—

Germany,	£80	Pillow, Jones & Co.

Pyrites—

La Laja,	582 t.	G. Ward & Sons
,,	68	T. S. Whitehead & Chambers

Plumbago—
E. Indies, 77 brls. Beresford & Co.
" 102 Prop. Chamb. Wf.
" 210 cks. J. Thredder, Son & Co.

Paraffin Wax—
U. S., 3,098 brls. J. H. Usmar & Co.
" 105 Rose, Wilson & Co.
" 680 H. Hill & Sons
" 29 G. H. Frank
" 2,880 J. H. Usmar & Co.

Potash—
Belgium, £146 Forwood Bros.

Picric Acid—
Germany, 1 pkg. Domeier & Co.

Potassium Oxalate—
Fredrikstad, £55 A. Hughes

Permanganate—
Germany, £30 H. Lorens

Potassium Sulphate—
France, 20 pks. Weatherley, Mead & Co.
Germany, 102 T. Farmer & Co.
" 1,219 Anglo-Contl. Guano Works
France, 20 Weatherley, Mead & Co.

Potassium Chloride—
Germany, 8 cks. Elkan & Co.

Potashes—
Montreal, 82 c. Charles & Fox
" 123 "

Pearl Ashes—
France, 200 c. F. W. Berk & Co.
Montreal, 30 Charles & Fox
France, 200 F. W. Berk & Co.

Stearine—
Belgium, 63 bgs. H. Hill & Sons
" 125 "
Holland, 80 Perkins & Homer

Saltpetre—
Germany, 20 cks. Craven & Co.
" 100 T. Merry & Son
" 610 H. Grey, jr.
" 60 J. Hall & Son
" 72 "

Sodium Sulphide—
Holland, £10 Domeier & Co.

Sodium Nitrate—
Germany, £76 Raltenbach & Schmitz
Holland, 35 "

Tar—
Germany, 7 brls. W. H. Hindley & Co.
N. Russia, 1,331 Sieveking, Droop & Co.

Turpentine—
U. S., 1,236 brls. Nickoll & Knight
" 2,830 "
Holland, 5 cs. Kaltenbach & Schmitz

Tartars—
Italy, £900 Howards & Son

Ultramarine—
Belgium, 5 cs. Magee, Taylor & Co.
Germany, 12 G. Steinhoff
Holland, 6 Hernu, Peron & Co.
" 39 pks. Ohlenschlager Bros.
Germany, 88 cs. Beck & Pollitzer

Zinc Oxide—
Germany, 10 cs. Beresford & Co.
Holland, 27 brls. "
" 100 M. Ashby, Ld.

Zinc Sulphate—
Germany, £65 B. & N. Wvs. Co., Ld.

LIVERPOOL.

Week ending November 11th.

Aluminium—
Ghent, 12 cs. J. T. Fletcher & Co.

Acetate of Lime—
New York, 2,382 bgs.

Acetic Acid—
Rotterdam, 10 cks.

Bone Size—
Dunkirk, 13 cks.

Bone Ash—
Rio Grande do Sul, 190 t. Reimers & Lassel

Boracic Acid—
Leghorn, 122 cks.
" 20 Shropshire Union Co.
" 50 H. Coghill

Borate of Lime—
Valparaiso, 131 cks.

Copper Ore—
Huelva, 1,110 t.
Montreal, 279 bgs. Excelsior Copper Co.
Marseilles, 181

Caoutchouc—
Pernambuco, 14 brls. Powell & Sing
" 108 52 bls. Fry, Miers, & Co.
Ambriz, 5 cks. Taylor, Laughland, & Co.
" 2 Werneth & Stock
" 6 2 bgs. T. Milligan, & Co.
" 2 Samson & De Liagre
Messina, 10 Taylor, Laughland, & Co.
Ambizette, 5 "
" 7 bgs. Samson, & De Liagre
" 5 J. Holt & Co.
Maculla, 6 Taylor, Laughland, & Co.
" 103 Samson & De Liagre
Banana, 1 69 Daumas & Co.
Landana, 3 pks. 3 brls. 3 cks. Edwards Bros.
" 2 bgs. 6 Pinto, Leite, & Nephew
Loango, 2 pns. Edwards Bros.
Cape Lopez, 1 J. Holt & Co.
Gaboon, 9 "
" 13 Daumas & Co.
" 30 A. V. Heyder
Cameroons, 7 R. & W. King
" 10 Lucas Bros.
" 3 Rider, Son, & Co.
Old Calabar, 2 brls. W. Dodd
" 7 Alexander & Christie
" 4 "
Quitta, 5 pns. 2 cs. J. H. Rayner & Co.
" 1 F. & A. Swanzy
" 1 brl. 1 A. Herschell
" 67 bgs. W. J. Rodatz & Co.
Addah, 6 cks. J. P. Werner
" 2 brls. W. J. Rodatz & Co.
Accra, 16 cs. F. & A. Swanzy
" 70 cks. J. J. Fischer & Co.
" 1 C. Lane & Co.
" 2 16 Pickering & Berthoud
" 1 4 Edwards Bros.
" 2 "
" 29 J. P. Werner
" 1 3 Hutton & Co.
" 1 2 H. B. W. Russell
" 2 2 A. Reis
SaltPond, 3 W. Griffith & Co.
" 11 A. Miller, Bros. & Co.
" 6 8 Edwards Bros.
" 1 W. B. M'Iver & Co.
" 1 Radcliff & Durant
Gr. Basam, 12 cs. 1 cks. W. D. Woodin
" 1 A. Millerson & Co.
" 9 Radcliffe & Durant
" 3 Mordaunt Bros.
" 4 F. Schaffer & Co.
" 1 S. & C. Nordlinger
" 2 Edwards Bros.
" 4 3 Pickering & Berthoud
" 2 Millward Bradbury
" 2 J. H. Rayner & Co.
" 6 1 A. Verdier
" 3 Pitt, Bros., & Co.
" 5 Ping & Abel
" 2 T. E. Tomlinson & Co.
" 13 A. Yandle & Co.
" 2 W. Duff & Co.
" 2 Letchford & Co.
" 1 Universal Bk.
" 3 pns. 12 27 brls.
Manoh, 11 brls Palma Trading Co.
" 2 Cie Francaise & Co.
Quitta, 7 A. Herschel
Accra, 25 J. J. Fischer
" 4 12 cks. J. P. Werner
Sierra Leone, 2 Owners of S. S. Fermose
" 4 T. Millington & Co.

Caoutchouc—*continued.*
Sierra Leone, 3 bgs. Pickering & Berthoud
" 12 pns. 29 brls. Cie Francaise & Co.
" 41 pks 34 Paterson Zachonis
" 51 "
Black Point, 1 cs. 1 pn. 1 ck. 1 bd.
19 bgs. Pinto, Liete, & Nephew
Loango, 27 bgs. Daumas & Co.
" 2 pns. 3 brls. Edwards Bros.
" 3 E. Tomlinson & Co.
Sette Cama, 2 pns. 63 cks. 3 bds. J. Holt & Co.
" 95 Hatton & Cookson
Cape Lopez, 22 J. Holt & Co.
Gaboon, 12 A. W. Heyden
Elobey, 10 J. Holt & Co.
Cameroons, 6 R. & W. Ring & Co.
" 4 Lucas Bros.
" 22 J. Holt & Co.
" 4 Rider, Son, & Andrew
Old Calabar, 1 pn. 20 African Association
" 2 brls. 1 cs. W. Dodd & Co.
" 2 8 cks. "
Para, 296 cs. R. Singlehurst & Co.
" 81 Biehier & Co.
Mussera, 14 bgs. Samson & De Liagre
" 19 brls. Taylor, Laughland, & Co
Kinsebo, 3 Samson & De Liagre
" 24 T. Millington & Co.
" 4 Werneth & Stock
" 7 Taylor Laughland, & Co.
Muculla, 4 "
" 61 Samson & De Liagre
Ambrizette, 36 5 J. Holt & Co.
" 53 Samson & De Liagre
" 9 Taylor, Laughland & Co
Banana, 34 Daumas & Co.
Cabenda, 1 ck. Hatton & Cookson
Lisbon, 1 454

Cream of Tartar—
Rotterdam, 5 cks.

Copper Precipitate—
Huelva, 4,787 bgs.

Dyestuffs—
Cochineal
Gr. Canary, 5 bgs. Widow, Duranty, & Son
" 12 Swanston & Co.
Extracts
New York, 45 bxs.
Valonia
Patras, 245 bgs. A. C. Culphorenzo
" 61 "
Logwood
Frontesa, quantity. Farnworth & Jardine
Jamaica, 529¼ t. Bernard Hall, & Co.
Sumac
Bordeaux, 25 brls.
Catania, 25 "
Palermo, 350 bgs. J. Young & Co.
" 150 250 J. Kitchen
" 50 1,300 "
" 300 "
Argols
Oporto, 26 cks. Cotesworth, Lyne, & Ca.
" 23 cks. F. Leyland & Co.

Glucose—
Boston, 100 brls. A. D. McKay & Co.
Hamburg, 13 cks.

Glycerine—
Rotterdam, 3 dms.

Horn Piths—
Rio Grande do Sul, 6,000 Reimers & Lassel

Isinglass—
Para, 14 cs. Bieber & Co.
" 28 Frith, Sands & Co.

Iodine—
Valparaiso, 32 brls. A. Gibbs & Sons
" 86 W. & J. Lockett

Manganese Ore—
Oporto, 90 t. Redfern, Alexander & Co.

Manure—
Phosphate Rock
Montreal, 113 t.
" 442 Phosphate Lime Co.

Potash—
Dunkirk, 8 cks.
Montreal, 11 brls. Makin & Bancroft
Rotterdam, 5 cks.

Pyrites—
Huelva, 1,400 t. Tennants & Co.

Phosphate—
Montreal, 125 t. A. Hunter & Co.
Ghent, 200 bgs.

Sulphur—
Catania, 300 bgs. 20 brls.

Soap—
Leghorn, 250 bxs. W. Sterry
" 100 Brown Bros. & Co.
" 300 "
New York, 12 pks. Ayrton & Saunders

Sulphur Ore—
Huelva, 1,636 t. Matheson & Co.

Saltpetre—
Hamburg, 170 cks.
Antwerp, 135 bgs. J. T. Fletcher & Co.

Soda—
Rotterdam, 3 cks.

Soapstone—
Genoa, 100 bgs. W. Harrison & Co.

Tartaric Acid—
Rotterdam, 6 cks.

Tartar—
Naples, 3 cks. T. Nickels & Co.
" 1 R. Powles

Ultramarine—
Rotterdam, 3 cks. 8 cs.
Hamburg, 12 "

Zinc Ashes—
Marseilles, 38 brls.

GRIMSBY.

Week ending November 8th.

Albumen—
Hamburg, 10 cks.

Chemicals *(otherwise undescribed)*
Hamburg, 10 cs.
Antwerp, 25 cks.

Dyestuffs *(otherwise undescribed)*
Hamburg, 11 pks.

Potash—
Rotterdam, 10 pks.

Zinc Ashes—
Antwerp, 12 cks.

GOOLE.

Week ending November 5th.

Acetic Acid—
Rotterdam, 4 cks.

Aniline—
Rotterdam, 44 cks.

Antimony Sulphide—
Boulogne, 5 cks.

Antimony—
Boulogne, 4 cks.

Caoutchouc—
Boulogne, 6 cks.

Dyestuffs—
Extracts
Rotterdam, 3 brls.
Alizarine
Rotterdam, 20 cks.
Logwood
Rotterdam, 4,475 pcs.
Belize, 582 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 19 cks. 6 cs. 5 pks.

Glycerine—
Hamburg, 3 cs. 2 crbys.

Glucose—
Hamburg, 35 cks.
Calais, 100 bgs.

Naphthol—
Rotterdam, 12 cks.

Potassium Muriate—
Rotterdam, 17 cks.

Potash—
Calais, 93 drs.
Dunkirk, 9 cks.

Tartaric Acid—
Rotterdam, 4 cks.

Waste Salt—
Hamburg, 165 cks. 400 t.
" 28

TYNE.

Week ending November 12th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.
Barytes Sulphate—
Ghent, 134 cks.
Barytes—
Rotterdam, 68 cks. Tyne S. S. Co.
Glucose—
Hamburg, 6 cks. Tyne S. S. Co.
Manganese—
Hamburg, 2 cks. Tyne S. S. Co.
Sulphur Ore—
Pomaron, 1,000 t. Mason & Barry
Salt—
Hamburg, 150 t. Clephans & Wiencke
" 290 "
Saltpetre—
Hamburg, 210 t. Clephans & Wiencke
Zinc Oxide—
Antwerp, 35 brls. Tyne S. S. Co.

GLASGOW.

Week ending November 13th.

Acetate of Lime—
New York, 290 bgs.
" 1,004
Alum—
Rotterdam, 40 cks. J. Rankine & Son
Antimony Salts—
Hamburg, 1 cs. 1 ck.
Borax—
Bordeaux, 20 cks.
Barytes—
Rotterdam, 92 cks. J. Rankine & Son
Chloral Hydrate—
Hamburg, 1 cs.
Dyestuffs—
Alizarine
Rotterdam, 186 cks. 3 cs.
" 18 2 J. Rankine & Son
Extracts
Rotterdam, 2 cks. J. Rankine & Son
Hamburg, 2 cs.
New York, 10 brls.
Glycerine—
Rouen, 10 cs.
Rotterdam, 5
Nickel Sulphate—
Hamburg, 1 cs.
Sodium Bichromate—
Rotterdam, 9 cks. J. Rankine & Son
Sulphur Ore—
Drontheim, 170 t.
Soap—
New York, 400 bxs.
Sodium Acetate—
Rouen, 10 cks.
Tartar—
Bordeaux, 12 cks. J. & P. Hutchison
" 3
" 2 J. & P. Hutchison
" 7
Rouen, 4 J. & P. Hutchison
Tartar Emetic—
Hamburg, 4 cks. 8 cs.
Zinc Oxide—
Bordeaux, 21 brls. J. & P. Hutchison
Zinc Sulphite—
Rotterdam, 5 cks.

HULL.

Week ending Nov. 13th.

Barytes—
Antwerp, 50 bgs 38 cks. Bailey & Leetham
Bremen, 12 Veltman & Co.
" 22 T. W. Flint & Co.
" 23 Tudor & Son
Chemicals *(otherwise undescribed)*
Dunkirk, 64 pks. Wilson, Sons & Co
Antwerp, 50 "
Genoa, 10 cks. Wilson, Sons & Co.
Rotterdam, 2 crbys. G. Lawson & Sons
Dyestuffs—
Alizarine
Rotterdam, 10 cks. 1 box Hutchinso & Son
" 5 cks. W. & C. L Ringrose
" 7 pks. W. & C. L, Ringrose
" 78 cks. Hutchinson & Son
" 10 pks. W. & C. L. Ringrose
Glycerine—
Dunkirk, 40 cks. Wilson, Sons & Co.
Glucose—
Hamburg, 10 cks.
Stettin, 500 bgs. 10 cks. Wilson, Sons & Co.
Kainit—
Hamburg, 500 bgs. E. Kipps & Co.
Phosphate—
Ghent, 150 t. Wilson, Sons & Co.
Saltpetre—
Hamburg, 6 cks.
Sulphur—
Christiansand, 222 bgs. Wilson, Sons & Co.
Turpentine—
Libau, 51 brls.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending November 5th.

Ammonia—
Natal, 24 drs. £35
Ammonia Salts—
New York, 2 cs. £13
Alum—
Galatz, 133 c. £37
B. Ayres, 5 t. 2 27
Ammonium Sulphate—
Madeira, 1 t. £12
Valencia, 200 2,400
Demerara, 15 3 c. 175
Rotterdam, 82 958
Arsenic—
St. Petersburg, 10 t. 2 c. £155
Antwerp, 9 t. 9 140
Sydney, 15 kgs. 12
Boston, 130 cks. 293
Alum Cake—
Bordeaux, 5 t. 5 c. £20
Ammonium Carbonate—
Amsterdam, 1 t. 16 c. £54
Rotterdam, 6 9
Adelaide, 5 9
St. Petersburg, 67 pks. 155
" 100 kgs. 143
Acetic Acid—
Adelaide, 10 cks. £27
Acid *(otherwise undescribed)*—
Hong Kong, 10 cs. £8
Cape Town, 10 8
Jersey, 5 crbys. 8
Borax—
Barcelona, 14 c. £22
Auckland, 1 t. 42
Bones—
Cologne, 10 c. £15
Treport, 31 t. 475
Martinique, 235 1,645
Rotterdam, 10 8 84
" 4 11 23
Barium Oxide—
Flushing, 14 tins. £100
Bisulphide of Carbon—
Philadelphia, 3 t. 13 c. £57
Brimstone—
Natal, 3 t. £21
Blue Stone—
Wellington, 10 c. £12
Charcoal—
Dunkirk, 40 t. 16 c. £198
Copper Sulphate—
Genoa, 5 t. £110
Adelaide, 5 100
Melbourne, 2 11 c. 48
Colombo, 7 8
Auckland, 11 10
Cream of Tartar—
Newcastle, 1 t. 3 c. £125
Adelaide, 10 55
Melbourne, 2 198
Cape Town, 2 cks. 12
Caustic Soda—
Port Natal, 10 c. £10
Varna, 83 48
Melbourne, 10 t. 6 120
Adelaide, 12 108
Mauritius, 20 12
Dunedin, 21 26
Carbolic Acid—
Treport, 14 c. £28
Stettin, 8 40
Clarifiants—
Bordeaux, 8 cks. £12
" 42 63
Citric Acid—
Aden, 1 c. £8
Brussels, 15 101
Cape Town, 1 7
Barcelona, 2 t. 298
St. Petersburg, 1 149
Odessa, 5 37
Corrosive Sublimate—
Madras, 2 c. £39
Coal Products—
Pitch
Havre, 581 t. £798
St. Nazaire, 670 960
B. Ayres, 5 10 c. 33
New York, 141 cks. 45
Rouen, 7 26
Tar
Wellington, 13 c. £7
Calcutta, 17 t. 17 59
San Francisco, 13 110
Benzole
Terneuzen, 24 t. 12 c. £700
" 9 18 398
Rotterdam, 106 rlts. 800
Naphthaline
Rotterdam, 40 t. £100
Madeira, 3 c. 11
Alizarine
New York 40 cks. £580
Naphtha
Treport, 26 cks. £110
" 25 102
Coal Products *(otherwise undes.)*
Ascension, 40 drs. £70
Auckland, 10 brls. 11
Aniline Salts
Auckland, 10 kgs. £70
Cologne, 3 cks. 15
Anthracene
Rotterdam, 252 cks. £2,134
Chemicals *(otherwise undescribed)*
Calcutta, 4 pks. £36
Demerara, 1 t. 7 c. 60
Cape Town, 4 cs. 11
Penang, 2 14
Brisbane, 10 18
Dunedin, 2 32 pks. 124
Auckland, 13 31
Colombo, 4 10
Disinfectants—
Hong Kong, 11 c. £18
Natal, 11 pks. 10
Gibraltar, 4 10
Paris, 25 cks. 75
Melbourne, 1,000 drs. 876
Calcutta, 18 14
Glycerine—
New York, 10 c. £79
Melbourne, 4 cs. 28
Shanghai, 10 18
Guano—
St. Vincent, 100 t. £1,000
Guadaloupe, 30 300
Landeneau, 25 200
Demerara, 50 500
Hypophosphate of Lime—
Philadelphia, 9 c. 106
Iodide—
Libau, 1 kg. £20
Lime Slag—
Madeira, 5 t. 1 c. £12
Magnesia—
M. Video, 2 cs. £21
Manure—
Auckland, 25 t. £75
Havre, 25 110
" 25 140
" Bordeaux, 12 6 c. 60
Lisbon, 5 18 31
Demerara, 45 468
Hamburg, 200 2,600
Natal, 50 670
Libertad, 1 8
Barbadoes, 125 954
Jersey, 95 505
Oxalic Acid—
B. Ayres, 2 cks. £17
Antwerp, 4 t. 2 c. 120
Phosphoric Acid
Hamburg, 13 cs. £110
Phosphorus—
Demerara, 1 c. £9
Sydney, 4 37
Wellington, 3 22
Potassium Iodide—
B. Ayres, 4 c. £223
Potash Crystals—
Sydney, 27 c. £80
New York, 1 cs. 3 cks. 45
Picric Acid—
Shanghai, 1 t. 7 c. £206
Superphosphates—
Landeneau, 50 t. £150
La Rochelle, 50 150
Sodium Silicate—
Mauritius 25 c. £6
Sugar of Lead—
B. Ayres, 2 cks. £15
Sulphur—
Demerara, 2 t. 10 c. £22
Algoa Bay, 200 cks. 86
" 1 7 14
Sulphuric Acid—
Cape Town, 3 t. 16 c. £42
Rotterdam, 17 drs. 18
Algoa Bay, 8 cs. 15
Sheep Dip—
Port Natal, 20 pks. £97
B. Ayres, 212 cs. 665
Algoa Bay, 330 drs. 142
Natal, 100 6 37
E. London, 10 50
" 200 45
Bombay, 25 15
Dunedin, 2 15
Wellington, 200 500
Soda Salts—
Montreal, 8 cs. £100
New York, 10 cks. 33
Salammoniac—
Varna, 36 c. £60
Bourgas, 1 t. 54
Salonica, 2 4 70
Gothenburg, 1 37
Superphosphate of Lime—
Madeira, 15 t. £48
Soap Lye—
Rotterdam, 2 t. 12 c. £60
Sodium Acetate—
Amsterdam, 2 t. 2 c. £41
Saltpetre—
Bahia, 5 t. £124
Cadiz, 2 11 c. 53
Gibraltar, 1 25
Rio de Janeiro, 5 115
Valencia, 2 1 49
Gibraltar, 12 10 263
Sodium Bicarbonate—
Auckland, 4 t. £23
Tartaric Acid—
Wellington, 6 c. £36
Newcastle, 10 75
Melbourne, 2 t. 257
Dunedin, 5 40

LIVERPOOL.

Week ending Nov. 8th.

Alkali—
Boston, 75 tcs.
Halifax, 6

Acetic Acid—
St Johns, 4 c. 3 q. £7

Alum—
Cape Town, 2 t. 13 c. £14
Galatz, 3 19 23
Larnaca, 19 5
Boston, 10 1 40
Aleppo, 1 17 10
Smyrna, 5 14 28
Syra, 4 5 21
Bahia, 1 5
Bombay, 11 6 61
Seville, 7 7 2 q. 37
Adelaide, 19 5

Ammonium Muriate—
Melbourne, 17 c. £16
Philadelphia, 30 t. 19 3 q. 687
Antwerp, 8 3 11

Ammonium Nitrate—
Carthagena, 1 t. 3 q. £65

Albumen—
New York, 2 t. 7 c. £25

Ammonium Sulphate—
New York, 27 t. 14 c. 1 q. £330
Rotterdam, 50 600
Bordeaux, 4 18 2 56
Valencia, 36 9 2 420
New York, 10 7 2 121
Antwerp, 42 10 488
Valencia, 74 10 834
Bordeaux, 25 3 305
" 14 168

Ammonium Carbonate—
Danzig, 10 c. £23
Philadelphia, 11 t. 15 2 q. 73
Antwerp, 2 1 6
Havana, 1 1 45
Venice, 10 1 17
Hamburg, 2 21
San Sebastian, 4 7
Seville, 8 1 13
Odessa, 2 1 1 67

Brimstone—
Calcutta, 5 t. £24
Mazatlan, 10 3 q. 47

Bleaching Powder—
Antwerp, 85 cks.
Baltimore, 114
Bilbao, 60 brls.
Bombay, 10 cs.
Boston, 1,097 85 tcs.
B. Ayres, 3
Calcutta, 100
Genoa, 176 40 dms.
Hamburg, 73
Havana, 20
Malaga, 30
Montreal, 183
Naples, 115
New York, 354
Odessa, 5
Philadelphia, 116
San Francisco, 114
San Sebastian, 67
Vera Cruz, 18
Antwerp, 30
Bombay, 4
Boston, 312 214 tcs.
Hamburg, 124
Leghorn, 20
New Orleans, 280
Odessa, 11
Rotterdam, 40
Rouen, 76

Bisulphate of Lime—
Oporto, 13 c. 2 q. £7

Boracic Acid—
New Orleans, 1 t. 7 c. 3 q. £54
Antwerp, 6 3 3 40

Borax—
Calcutta, 10 c. £17
Hamburg, 2 t. 6 2 63
Yokohama, 2 19 2 190
Barcelona, 1 1 31

Bone Meal—
Montreal, 200 t. £11,000

Borate of Lime—
Rotterdam, 10 t. £110
Hamburg, 1,296 bags 1,000

Caustic Soda—
Alexandria, 78 dms.
Amsterdam, 100
Antonina, 6
Bahia, 10 kgs. 50

Caustic Soda—*continued.*
Bilbao, 32 dms.
Boston, 80
Brisbane, 45
Callao, 20
Catania, 50
Ceara, 45
Chicago, 100
Colombo, 19
Corfu, 25
Corral, 3 cks. 4
Dunedin, 20
Galatz, 80
Genoa, 110
Ghent, 35
Halifax, 20
Hamburg, 21
Ibrail, 32
Libau, 72
Malaga, 30
Mazatlan, 40
Melbourne, 56
Montreal, 250
" 250
Naples, 45
New York, 400
Odessa, 25
Oporto, 52
Pasages, 30
Pernambuco, 30
Philadelphia, 300
Riga, 106 kgs. 104
Rio de Janeiro, 23
St. Croix, 3
San Sebastian, 50
Santander, 18
Santo Domingo, 35 2 cks.
Sydney, 2 pks. 32 10 bxs.
Tarragona, 45
Vera Cruz, 27
Wellington, 25
Alexandria, 18
Algoa Bay, 10
Amsterdam, 199
Bahia, 10
Barcelona, 70 cks. 217
Batoum, 177
Boston, 200
Brisbane, 20
Cape Town, 302
Carthagena, 6
Catania, 45
Corfu, 2
Corunna, 8 brls.
Fiume, 22
Galatz, 208
Galveston, 60
Geelong, 34
Genoa, 30 pks. 139
Hamburg, 25
Ibrail, 22
Leghorn, 26
Lisbon, 24 2 cks.
Malaga, 30
Malta, 3
Melbourne, 38 68
Messina, 80
Montreal, 36
Naples, 95
New York, 1,490
Rotterdam, 18
Rouen, 110
Santander, 33
Santo Domingo, 70
Seville, 127
Stockholm, 15
Sydney, 52
Trieste, 22
Tunis, 4
New Orleans, 100
Philadelphia, 202 315 brls.

Cream of Tartar—
St. Johns, 12 c. £61

Copper Sulphate—
Calcutta, 5 t. £88
Gothenburg, 1 1 c. 1 q. 19
Nantes, 7 11 2 125
Oporto, 2 1 36
Barcelona, 10 1 181
Bordeaux, 10 185
Genoa, 12 9 2 220
Venice, 10 2 178
Oporto, 2 2 40
Calcutta, 5 88
Barcelona, 13 6 3 250
Constantinople, 1 15 33
Samsoun, 1 2 3 21
Genoa, 13 7 3 252
Gothenburg, 1 3 3 22
Odessa, 2 19 2 56
Nantes, 5 92
Montreal, 10 3 1 181
Odessa, 6 3 2 110
Tarragona, 10 200
Genoa, 17 1 294
Venice, 2 19 51
Madras, 2 38
Stettin, 2 9 3 45

Copper Sulphate—*continued*
Hamburg, 10 t. £180
Genoa, 40 11 c. 1 q 725
" 10 1 200
Leghorn, 5 90
Nantes, 131 6 2 2,346
Antwerp, 1 3 18
" 2 1 36
Barcelona, 5 2 90
" 45 4 1 827
Venice, 19 7 345
San Sebastian 20 1 378
Sydney, 10 185
Syra, 10 3 10
Valparaiso, 5 100
Barcelona, 10 196
Naples, 13 12

Carbolic Acid—
New York, 2 t. 8 c. 1 q. £140
Hamburg, 1 10 18
New York, 20 cks. 6 cs. 240
" 2 5 c. 92
Halifax, 1 3 q. 10
Hamburg, 4 19 1 392
" 18 1 68
Boston, 1 2 63

Citric Acid—
Bilbao, 5 c. £37

Copperas—
Aleppo, 2 t. 10 c. £5
Galatz, 5 4 10
Smyrna, 6 6 14
Constantinople, 3 4 7
Volo, 2 19 6
" 3 13 8
Larnaca, 2 16 6

Caustic Potash—
Savanilla, 10 c. 3 q. £23

Chemicals *(otherwise undescribed)*
Montreal, 15 t. 1 c. 2 q. £106
Asequipi, 2 7
Carthagena, 4 1 22
New Orleans, 125 cks. 234

Disinfectants—
Bombay, 11 c. £7
Sierra Leone, 2 cs. 5

Dried Blood—
Montreal, 2 t. 15 c. £40

Epsom Salts—
Bombay, 40 kgs.
Montreal, 40
Rio de Janeiro, 30 brls.

Gypsum—
New York, 10 t. 1 c. £30
Boston, 10 2 30

Glycerine—
Lisbon, 2 c. £7
St Johns, 4 13
Montreal, 1 t. 10 87
Hamburg, 4 5 q. 106

Iron Oxide—
Philadelphia, 12 t. 12 c. £300

Manure—
Barbadoes, 20 t. 1 c. 3 q. £160

Magnesia—
New York, 9 crts. 35 cs.

Magnesium Chloride—
Montreal, 2 t. 12 c. £7

Oxalic Acid—
San Francisco, 2 t. 14 c. £92
Barcelona, 9 t. 19 263
Paris, 5 1 1 q. 159

Pitch—
Genoa, 1,697 t.
Marseilles, 1,623

Phosphorus—
Shanghai, 10 c. 1 q. £70

Phosphate—
Hamburg, 16 t. 12 c. 3 q. £80

Potashes—
Catania, 1 t. 12 c. 2 q. £38

Potassium Bichromate—
Syra, 8 c. 1 q. £25
Hong Kong, 12 3 22
San Sebastian, 1 t. 4 3 43
Alexandria, 1 36

Potassium Chlorate—
New York, 12 t. 10 c. £564
Yokohama, 3 150
Antwerp, 4 17 2 q. 35
Sydney, 2 92
Ghent, 2 93
Carril, 12 31
Havana, 1 10 128
Buenos Ayres, 1 16 1 90
Vigo, 1 49
Yokohama, 3 140
Manaos, 1 3 5
Boston, 7 10 345
" 6 5 272

Potassium Carbonate—
New York, 12 t. 8 c. £173

Sodium Silicate—
Madrid, 25 brls.
Seville, 50
Barranquilla, 8
Cape Town, 20
Corunna, 10
Lisbon, 4 cks.
Montreal, 159
" 64
Piræus, 32 10
San Sebastian, 21
Seville, 7
Santander, 43
Sydney, 7

Sodium Carbonate—
Calcutta, 34 brls.
Halifax, 6
Montreal, 430
Rotterdam, 59
Vera Cruz, 4 kgs.

Sodium Bicarbonate—
Bremerhaven, 1 ck.
Calcutta, 1,750 kgs.
Constantinople, 10 brls.
Halifax, 100
Melbourne, 400
Montreal, 505
Para, 3 cks.
Paris, 50
Rotterdam, 125 2
Taltal, 5 cs.

Salt—
Adelaide, 202 t.
Antwerp, 42½
Calcutta, 2,806
Cape Town, 25
Conakry, 10
E. London, 62
Melbourne, 323
Montreal, 126
New Orleans, 100
New York, 80
Rio de Janeiro, 2 3 cs.
Rotterdam, 162
San Francisco, 130
Sydney, 312½
Valparaiso, 100
Philadelphia, 65
Goree, 67
Antwerp, 182
Bahama, 40
Benin, 20
Bilbao, 5
Boston, 100
Brisbane, 100
Buguma, 20
Calcutta, 4,499
Copenhagen, 1,092
Demerara, 56
E. London, 85
Manaos, 5
Montreal, 284
Saltpond, 6 5 c.
Trinidad, 11 19
Valparaiso, 5

Soda Crystals—
Boston, 420 brls.
Constantinople 50
Halifax, 20
Ibrail, 45
New York, 374 kgs.
Smyrna, 120
Sydney, 25
Constantinople, 125
Gibraltar, 30
Halifax, 25
Malta, 10
New York, 334
Philadelphia, 167
Samsoun, 20

Soap—
Bombay, 8 cks. 69 bxs.
Calcutta, 20 cs.
Cape Coast, 1
Corinto, 1
New York, 6
Valparaiso, 20 3
Ghent, 3 pks.
Alexandria, 19 2
Algoa Bay, 13 bdls. 1,450
Antwerp, 200
Barbadoes, 650
Boca, 20 cks.
Bombay 15
Bonny, 357
Calcutta, 1 pk. 2 cs.
" 250
Cape Coast, 100
Cape Town, 1,052 6
Colon, 100
Conakry, 45
Curacao, 50
Durban, 500
E. London, 3 bdls. 3,300

Soap—*continued.*
Gibraltar, 350 bxs.
Hambay, 375 cks.
Iquitos, 300
Kingston, 1 pks. 745
Leghorn, 20
Livingstone, 50
Malta, 10
Manaos, 950
Montreal, 10 cs.
Mossel Bay, 460
Piræus, 7
Port Natal, 1,588
Rosario, 6
St. Lucia, 125
Saltpond, 100
Shanghai, 501
Singapore, 500
Smyrna, 4
Trinidad, 1,035

Soda Ash—
Alicante, 10 cks.
Baltimcre, 795 233 tcs.
Boston, 400 bgs. 477 29
B. Ayres, 200 brls.
Carthagena, 25
Constantinople, 30
Corfu, 20
Malaga, 6
Maranham, 100
New York, 124 404
Rio de Janeiro, 95
San Francisco, 12 kgs.
Smyrna, 100 bls.
Adelaide, 40
Boston, 73 cks. 500 bgs. 221
Canea, 50 brls.
Carthagana, 25
New York, 172 cks. 1,955
Piræus, 20 brls.
Santander, 3
Smyrna, 300
" 35
Sydney, 35
Philadelphia, 168 cks. 555

Saltpetre—
Para, 10 c. £10
Montreal, 1 t. 21
Maceio, 11 c. 2 q. 13
Havana, 1 t. 3 23
Maceio, 1 10 33

Sodium Nitrate—
Portland, 1 t. 2 c. £9
Avilles, 1 1 1 q. 9
Barcelona, 12 16 2 110
Huelva, 37 11 322

Sodium Sulphate—
Santander, 3 t. 1 c. 1 q. £11

Sheep Dip—
Punta Arenas, 2 t. £100

Sodium Acetate—
New York, 5 t. 12 c. 3 q. £90

Saltcake—
Philadelphia, 24 t. 4 c. £40
Baltimore, 35 3 84

Sulphur—
Matanzas, 7 cks. £10
Boston, 10 t. 1 c 45
" 25 1 106
Montreal, 80 2 330
New York, 50 9 1 q. 225
Valparaiso, 15 1 2 89

Sodium Bisulphide—
Calcutta, 6 t. £32

Sodium Hyposulphate—
Mazattan, 30 t. 3 c. £182

Sodium Chlorate—
Hamburg, 20 kgs. £55
New York, 2 t. 10 c. 148
" 3 10 217

Salammoniac—
Calcutta, 2 t. 8 c. £85
Galatz, 11 3 q. 20
Shanghai, 16 1 30
Salonica, 1 1 36
Ibrail, 11 1 20
Piræus, 2 2 5
Leghorn, 1 2 40
Patras, 8 14
Malta, 3 16 131
Marseilles, 16 28

Sodium Biborate—
Piræus, 3 c. 3 q. £6
Cardinas, 5 8
Antwerp, 6 t. 6 c. 189
Montreal, 3 11 1 96

Zinc Muriate—
Bombay, 2 t. 10 c. £43
" 1 15 3 q. 26
" 2 10 36

Zinc Chloride—
Bombay, 2 t. 7 c. 36
Boston, 5 8 2 q. 39

GLASGOW.

Week ending November 13th.

Ammonium Carbonate—
Valparaiso, 15¾ c. £24
Christianiâ, 10 kgs. 20

Ammonia—
B. Ayres, 3 t. 15 c. £114

Ammonium Sulphate—
Calcutta, 15 t. 15 c. £170
Nantes, 55 11¾ £781

Bleaching Powder—
Brisbane, 12 t. 8 c. £62

Dyestuffs—
Logwood
Boston, 42¾ c. £25
Quebec, 50 t. 6¾ 335
Extracts
Quebec, 141½ c. £251
Fustic
Quebec, 3 t. 13½ c. £23. 14s.

Lead Nitrate—
Quebec, 2 t. 11¾ c. £54

Pitch—
Bombay, 27 t. 8 c. £93
" 2 1 13
Rouen, 25 11 £25. 11s.
Gothenburg, 141 t. 9 c. £369

Potassium Prussiate—
New York, 7 t. 19 c. 583

Potassium Bichromate—
Gothenburg, 3 t. 12 c. £95
" 397½ 622
Boston, 331 580
New York, 472 606
Antwerp, 19 522

Paraffin Wax—
Antwerp, 10 t. 3 c £318
Rouen, 1,320 lbs. 25

Sulphuric Acid—
Cape Colony, 4 t. 16½ c. £29. 10s.

Soap—
Cape Colony, 51 c. £71
Valparaiso, 1 t. 10 £29. 18s.

Soda Salts—
Christiania, 2 cks. £5

Sodium Bichromate—
Genoa, 52 c. £70

Tar—
Bombay, 4 c. £59. 15s.

Tartaric Acid—
B. Ayres, 44¼ c. £309

HULL.

Week ending November 11th.

Alkali—
Hamburg, 1 ck.
Odessa, 20

Borax—
Genoa, 2 cks.

Bone Size—
Amsterdam, 8 cks.
Bremen, 3

Bleaching Powder—
Rotterdam, 12 cks.

Copper Sulphate—
Drontheim, 5 cks.
Gothenburg, 1

Caustic Soda—
Antwerp, 18 drms.
Christiania, 1
Helsingfors, 163
Libau, 134
Rotterdam, 36
St. Petersburg, 86

Chemicals *(otherwise undescribed)*
Amsterdam, 2 cs. 1 pks.
Antwerp, 4 16 cks.
Bergen, 19
Christiania, 31 21 1 158 slbs.
Copenhagen, 30 5 22
Drontheim, 128
Genoa, 33
Gothenburg, 8 628
Hamburg, 38 2 18
Konigsberg, 10 4
Malta, 2
Naples, 6
New York, 100
Odessa, 218 140
Rotterdam, 10 60
Rouen, 90
Reval, 18
Stockholm, 2
Stettin, 1
St. Petersburg, 84

Dyestuffs *(otherwise undescribed)*
Christiania, 5 bls. 2 cks.
Gothenburg, 2 cs.
Hamburg, 2 8
Rotterdam, 2 drms.
Revel, 3 64
St. Petersburg, 84

Ferro Manganese—
Libau, 20 t.

Manure—
Genoa, 100 bgs.
Rouen, 100
Stettin, 50 t.

Pitch—
Antwerp, 50 t.
Genoa, 379

Soap—
Bremen, 13 cs.

Turpentine—
Alexandria, 10 cks.
Malta, 2

Tar—
Hamburg, 10 cks.

TYNE.

Week ending November 12th.

Antimony—
Montreal, 1 t.
" 2
" 2
Hamburg, 1 4 c.
New York, 45

Alkali—
Amsterdam, 8 t. 9 c.
" 34 12
" 5 14
Rotterdam, 17 16
Leghorn, 10 12

Alumina Sulphate—
Rouen, 10 t. 1 c.
Montreal, 10 2
" 4 19
" 10

Alum Cake—
Copenhagen, 10 t. 6 c.

Ammonium Carbonate—
Copenhagen, 11 c.
Libau, 2 t. 5

Barium Chloride—
Rouen, 5 t. 6 c.

Bleaching Powder—
Hamburg, 7 t. 17 c.
" 21 12
" 17 14
Antwerp, 10 15
" 108 5
Gothenburg, 16 17
Naples, 3 3
" 2 12
Newfairwater, 57 8
Amsterdam, 7 1
" 38 4
Rotterdam, 15 9
" 17 10
" 2 12
" 29 6
Konigsberg, 68 7
Rouen, 27 4
Montreal, 5 1
Lisbon, 5 6

Barytes Carbonate—
Rouen, 87 t. 7 c.
Hamburg, 6
Antwerp, 20 16

Calcined Magnesia—
Rouen, 4 c.

Caustic Soda—
Amsterdam, 1 t. 9 c.
Montreal, 29
" 10 3
" 14 10
New York, 87 1
Genoa, 12 19
Copenhagen, 5 14

Epsom Salts—
Naples, 1 t. 2 c.

Gypsum—
New York, 92 t.

Litharge—
Amsterdam, 4 t. 6 c.
Rouen, 4 14
Montreal, 20 2
" 5 5
Hamburg, 16
Ghent, 1 3
Leghorn, 2 19
Copenhagen, 5

Magnesium Carbonate—
Rouen, 3 t. 12 c.

Magnesia—
Montreal, 9 c.
Lisbon, 7

Pitch—
Montreal, 156 t. 19 c.

Potassium Chlorate—
Rotterdam, 1 t.
Hamburg, 10 c.
Antwerp, 3 3
Copenhagen, 2 14

Sodium Hyposulphite—
Montreal, 2 t. 15 c.
" 1

Soda Salts—
Amsterdam, 4 t. 15 c.

Soda Ash—
Konigsberg, 174 t. 14 c.
Montreal, 23 10
Lisbon, 10 17
Hamburg, 1 19
Antwerp, 10 16
Ghent, 2 4
Gothenburg, 13 15
New York, 200 8
Newfairwater, 33 2
" 89 16
Libau, 32 15

Soda—
Esbjerg, 6 t.
Rotterdam, 18 11 c.
" 15 12
Montreal, 37 10
" 12 10
" 7 10
" 50 1
" 56 8
" 3 15
" 7 10
Christiansand, 1 6
Aarhuus, 24 15
Genoa. 6 9
New York, 208 3
Nakskov, 3 4
Svendborg, 4 15
Pasages, 6

Sodium Suphate—
Konigsberg, 25 t.
Montreal, 76 11 c.
Libau, 101
Gothenburg, 50

Sodium—
Hamburg, 2 cs.
Antwerp, 1

Sulphur—
Antwerp, 3 t.
Rotterdam, 16 6 c.
Rouen, 10

Sodium Silicate—
Rotterdam, 6 t. 1 c.

Tar—
Montreal, 40 t.
Christiansand, 1 7 c.

GRIMSBY.

Week ending November 8th.

Coal Products—
Dieppe, 8 cks.

Chemicals *(otherwise undescribed)*
Hamburg, 20 cs. 10 cks.
Rotterdam, 11

GOOLE.

Week ending November 5th.

Bleaching Powder—
Rotterdam, 53 cks.

Benzole—
Rotterdam, 91 cks.

Coal Products—
Calais, 34 cks.

Chemicals *(otherwise undescribed)*
Ghent, 6 cks.
Rotterdam, 5

Dyestuffs *(otherwise undescribed)*
Antwerp, 20 cks.
Boulogne, 2 cs. 13 6 drms.
" 4 tins.
Ghent, 1 2

Manure—
Boulogne, 113 bgs.
Bruges, 200
Ghent, 683

Pitch—
Antwerp, 846 t.

PRICES CURRENT.

WEDNESDAY, NOVEMBER 19, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. ..per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. ,,	1	15	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	10	15	0
,, ,, (grey), Hull .. .. ,,	10	15	0
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	5	0
,, Carbonate (native) .. .. ,,	3	10	0
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	6	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	4	9
,, 50/90 ,, ... ,,	0	3	7
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	6
,, (crude 60°) .. .. per gallon	0	1	5
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	7
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	15	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	11
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	54	0	0
,, Sulphate .. .. ,,	18	15	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	12	6
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	0	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	17	6
,, ,, (grey) .. .. per ton	13	0	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	10½
Oils:—			
Cotton-seed .. .. per ton	19	10	0
Linseed .. .. ,,	23	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅜
,, American .. .. ,,	0	0	5¾
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. per cwt.	£3 5 0 to 3	10	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	3	9
,, Nitrate .. .. ,,	0	2	10
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	2	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	7	6
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	12	6
,, ,, (70 % Caustic Soda) ,, .. ,,	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	7	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9		0
,, Nitrate (95 %) ex-ship Liverpool .. ..per cwt.	0	8	6
,, Nitrite, 98 % .. .. per ton	31	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¾
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	5	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	25	10	0
Tin (English Ingots) .. .. ,,	94	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	24	0	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

THE

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SPECIAL NEW YEAR'S NUMBER OF THE "CHEMICAL TRADE JOURNAL."

In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

On the occasion of the New Year's Special Number, we shall make use of the whole of the lists we have referred to, numbering altogether, as we have stated not less than 10,000 names.

Of course, for this special issue. there will be special prices for advertisements, but those who order a series, either commencing with that number or previously, will have the advantage of our regular tariff rates, of bringing their specialities under the notice of a very large circle of buyers.

As only a limited number of pages will be added for advertisements, early application for space is necessary. We shall be pleased to send tariff of charges to all those who may desire to advertise in this Special Number.

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Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates :—

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TRADE SECRETS.

IN our daily experience we meet by no means infrequently with the man who says "there are no such things as trade secrets," that the advance of technical education (!) and the cupidity of the workman have proved too much for the successful preservation of them from poachers. We are inclined to think differently. And in this matter we must not leave out of our consideration the English Patent Laws. For, let us consider a moment, the man who, to use a familiar expression, has got a good thing. He must either go to the Patent Office, or he must not. If he does not go to the Patent Office, he can only work it as what is known as a trade secret. If he goes to the Patent Office, his invention by the very name and operation of his act is *not* a secret, and is embarked upon a sea full of squalls, of storms, and shoals, and hidden rocks. His invention may be argued out by lawyers, practically paid by the hour; he has to face the fact that the old law of the strongest of barbaric times finds its equivalent in the law of the longest purse to-day, all the acumen of the lawyer, aided by all the ingenuity of the scientific expert, may be arrayed against him, until, wearied in the contest, he fails to effect further security for his patent, which falls in as public property in a year or two from its inception, and is eagerly adopted even by people who have been loud in their assertion that it was of no use, was not new, would not pay, and many other objections too numerous to mention. It may be noted in passing that all this is perfectly legal and legitimate. If those who have courted the protection of the Patent Office were counted and compared with those who had been defeated in the manner we have indicated, the percentage would be found to be by no means contemptible. Patent an invention, and tell everybody how you work it. This is the sum and substance of patenting.

What about the alternative? The trade secret, which does not exist, forsooth! Strange to say, experience in working patented inventions, proves that it can exist, for has it not often happened, especially in chemical patents that the invention has been worked by other firms "on the quiet" without paying to the inventor that which was his due? Was this not *secret*? and was it not kept by the methods usually adopted by those who keep secrets, by dint of strict precautions and making it worth the while of those who are necessarily in the secret, to keep it to themselves?

What about compressed steel? Are the details of its production patented? If not they are a trade secret?

We remember a few years since, we were shown through the works producing this material, but were carefully nursed past the closed doors of the place where it was produced, and in other departments of steel production, the same may be said. In the production of high-class steel wire of great tenacity for wire ropes, in the production of the beautiful lustrous blue on steel goods, in razors, in certain brands of steel for ordnance, armour, and propeller shafts, in the browning of gun barrels, the trade secret has proved more lasting and more profitable than the patent. Go to the glass trade, and it is the same, the manufacturers of certain varieties

of glass in the country have not shown any intention of going to the Patent Office with their processes. No, they relied on lock and key and secrecy. And now, turning to what are called chemical works, we could point to a goodly number who are, to our certain knowledge, steering in a course directly opposite to that of bankruptcy, who are working processes not generally known, not patented, and therefore Trade Secrets.

The working of a trade secret is profitable for both master and man. The master is freer from competition and gets better prices; the man is more relied upon and gets better wages, and stands head and shoulders above his fellows.

DYE-WOOD EXTRACTS.

THE manufacture of dye-wood extracts consists essentially (says Soxhlet in the *Chem. Zeitung*) of three operations: first, the chipping or rasping of the raw material; second, the extraction of the colouring matter; and third, the evaporation of the decoction obtained in the second operation.

Chipping or rasping is essentially a mechanical process, and it is not necessary to pursue it further.

In most manufactories a so-called ageing process is carried out before extraction, especially with logwood, and the most unimaginable chemicals are used for this purpose—carbonate and chloride of ammonia, stale urine, chalk, soda, saltpetre, glue, etc., being the chief. The chipped wood is placed in heaps and wetted with solutions of these bodies, and these heaps are kept and turned over from time to time. This process is based entirely on imaginary suppositions and not on absolute facts.

The industry of extract making sprang up at the beginning of the present century, and was introduced by a ship captain named Meissonier, who conceived the idea of making both a liquid and a solid extract of the colouring matter of his cargo of dye-wood. He used porcelain vessels in his operations. He was not a professional chemist, nor were his successors, and no improvement in a chemical sense was made. The improvements in the machinery which took place merely followed those made in the manufacture of sugar, and diffusion batteries and vacuum apparatus are in use to-day.

Extract factories were first established in France, and later in England and America, but only within the last few years in Germany. In all places the relation of extract making to chemistry has remained the same. The managers of the large works are at the best technical engineers who attribute little or no value to the chemical part of the process and have little or no knowledge of chemistry. A chemist may be employed, not to supervise the process, but as a tester to compare the relative value of the firm's own extract with that of their competitors. In some works the managers are men who have mostly a knowledge of the working of the extraction apparatus and the machinery

The extraction of the dye-woods may be carried out by two different methods; (1) by maceration in open extractors—diffusion processes. This is also known as the French method, from having been first employed in France. (2) Extraction with the help of steam pressure and high temperature in closed vessels; first applied by Sanford in America, and known generally as the American method. Each of these processes has its advantages and disadvantages. For special purposes, in printing, etc., an extract obtained by the French method is decidedly to be preferred. It is higher in price, but this is counterbalanced by its superiority. The case is different in logwood extracts to be used in dyeing cotton, etc., where the purity of the tone is not so much an object as the intensity of the colour and the cheapness of the product. When logwood is extracted in open vessels about 16¾ per cent. of solid extract is obtained, while the American method yields 20-21 per cent.; on this difference the existence of the works often depends, and those works which use the open extractors cannot compete with those which use closed extractors, and therefore they are induced to adulterate their products with molasses, glucose, dextrin, tannin, etc. In the cheaper French extract these adulterations often exceed 50 per cent.

The manufacturer of American-process extracts generally sends out his products in the pure state. In the United States, admixtures were never made which could be called adulterants. Extracts of logwood were mixed with those of quercitron and hemlock, but these mixed extracts were sold as "black extracts," "logwood substitute," and so on.

Logwood extracts prepared by the American method generally contain fragments of wood, which is a defect which can be remedied. The manufacture, owing to the scarcity of logwood, has undergone some change. Roots are being largely used, and inferior qualities are also much used, and the result is that the extracts now made are not as good as formerly, It is probable that this industry will decline, and that the growing aniline colour trade will put an end to it.

DRIED POTATOES AS A NEW ARTICLE OF SALE.

THE drying of the potato begins to get very important. Through this process they are brought into a state, in which they cannot spoil easily; when dried their sale is not restricted, because they lose considerably in weight and the expenses for transport are diminished. It is the same with the keeping of them; they may be kept in any place whatever, as long as it is dry and they take little room. At the sale they are easily handled, and one can carry, without effort, a couple of hectolitres of potatoes after their being dried. For drying purposes potatoes of inferior quality may be taken. During those years, when potatoes are exposed to rotting, they can be saved from it by their being dried; furthermore, they are guarded against getting stale, shrinking and sprouting, all phases during which potatoes lose a good deal of their value, because their constituent parts are decomposed. On account of their taking little room, they can be easily shipped to places, where they do not grow. Therefore they are also important as provisions for ships and armies. For the drying of potatoes common kinds may be made use of, as even these furnish a good article of food. This drying is also important, inasmuch as it can be done in connection with that of fruit. When the fruit season is passed, the drying of potatoes can begin. The arrangements for this purpose are kept up a little longer and the capital fetches all the more.

Those kinds (says *Kuhlow*) which have smooth skins and deep lying eyes, are suited best for drying, because there are less parings, and the peeling can be done more quickly—If the affair is managed on a large scale, the peeling is done with machines. This process finished, they are washed in clean water, cut into slices and thrown into a concentrated solution of kitchen-salt, in which they remain from 15—20 minutes. Some water is extracted from them by this salt-water bath, and their time of keeping, after they are dried, lengthened. The bath also prevents the discolouring of the cut potatoes, against which is used—with respect to fruit which is going to be dried—the sulphurating process. The salt water has no bad effect on the potatoes, because during the act of lixiviation no sugar or other substances are extracted.—It is particularly important that no starch should be lost.—After the potatoes are taken out of the salt-water they are allowed to drain, and then they are taken into the drying-room.

They are placed, like fruit, on hurdles, and dried in a temperature of 80—90° C. They are left longer in this room than fruit, and dried harder, because potatoes contain much starch, which is exposed—more than sugar—to decomposition. To preserve or send them away, they are packed into boxes or barrels. These dried potatoes may be used like new ones, after they have been soaked in water from 12—15 hours.

THE DETERMINATION OF FERROCYANIDE IN SPENT OXIDE.

By R. Zaloziecki.

THE author employs (Zeit. f. Angw. Chem.) the method previously proposed by him for the determination of ferrocyanide salts and in examining spent oxides, in the following manner: Twenty grms. of the finely divided substance are warmed to a moderate temperature, on the water-bath, for a quarter of an hour, with 20 cc. of 10% caustic potash solution and a little water in a 100 cc. flask, and, after cooling, diluted to 100 cc. with water. Fifty cc. of the clear solution (or, more accurately, 45 cc. measured by a burette, because 20 grms. of substance occupy a volume of 10 cc.) corresponding to 10 grms. of the sample, are boiled over the flame in a 100 cc. flask until all ammonia has been completely driven off, and the solution then exactly neutralised with dilute acid. In order to hit the neutral point exactly, it is convenient to add a few drops of phenol phthalein solution and run in the acid from a burette until the red colouration disappears. The solution becomes clear more rapidly when the ammonia is expelled by milk of lime and the lime precipitated by potassium carbonate. Twenty cc. of normal sodium carbonate solution are then added to the liquid, to prevent the disturbing influence of potassium chloride or sulphate, and the decomposition is then carried out; 5 grms. of moist zinc carbonate being added, a current of carbon dioxide passed through the liquid, and the mixture heated for half an hour. The liquid is allowed to cool after the reaction is over, and is then made up to 100 cc. Fifty cc. of this, corresponding to 5 grms. of the original sample, are titrated with deci-normal acid and methyl orange, the acid corresponding to the 10 cc. of normal carbonate solution previously added, being substracted from the acid required. If the acid is arranged so that 1 cc. = ·001 grm. K_2CO_3, the number of ccs. required in the final titration multiplied by ·23 and doubled gives the percentage of crystallised ferrocyanide of potassium in the spent oxide.

MACIVOR'S PATENTS, LIMITED.

THE first ordinary general meeting of the shareholders in MacIvor's Patents (Limited) was held yesterday at the City Terminus Hotel, under the presidency of Mr. J. Jepson Atkinson. The chairman stated that the present was the statutory meeting, at which no business could be done, and there was no resolution to submit. He might, however, state that the working capital, £50,000. had been amply subscribed for and allotted, and every penny of it was intact. Shortly after they went to allotment an action was commenced against them for the infringement of a patent. Immediately on their receiving notice of this all their capital was invested at interest with a leading financial body in the City upon ample Government security, and a considerable part of it was so invested at the present time. They then took the opinion of the most eminent counsel obtainable and of experts, and upon their expressed opinion they had proceeded with the purposes for which the company was formed. They had settled with the vendors. No time had been wasted. In the last few months they had so perfected their process that the ores mentioned in the prospectus as being about to be worked by them were not now necessary, and what they required was procurable in unlimited quantities, not only in foreign countries but also in England. The directors were now so confident of their position that they were prepared to go on at once with their work, and though they had not put up the building at the place which was originally intended, they proposed taking a place which they very much preferred, where the materials could be delivered at a lower price. Since going to allotment all the reports they had received from experts and from the trade confirmed all the statements made in the prospectus. In answer to questions, Mr. Hays (the solicitor) stated that the vendors had been paid £25,000. in cash, instead of £83.000., and they had received £33,000. in shares. This left a balance of £58,000. due to the vendors, which the company had two years to pay in, and which they then had the option of paying in cash or fully paid up shares. The whole of the capital had been allotted excepting the £58,000. in shares, which the company retained in view of settling with the vendors. The negotiations for the works were not actually completed, but they believed the contract would be signed in almost a few hours. The place was near London, close to the Thames, and to an abundance of chalk. The most eminent counsel of the day stated that theirs was a perfectly valid patent, and that it was the property of the company. As to the action referred to, the matter was still *sub judice*. An injunction was applied for, but it was not granted. The chairman, in further reply, stated that the plant had been ordered, and their engineer was of opinion that it would be in full operation within three months. An application to the Stock Exchange for a quotation would be made in due course, a settlement having only just been arrived at with the vendors.

COLOURLESS TANNINS.

M. A. VILLON describes in the *Bulletin de la Societe Chimique* his method for obtaining colourless tannins from tannin drugs such as chestnut, wood, quebracho, sumac, valonia, divi-divi, oak wood, etc.

It comprises three principal operations: 1st, lixiviation, of the raw tannin materials; 2nd, precipitation of the tannin as an insoluble tannate; 3rd, separation of the tannin.

For the lixiviation of the tannin matters, six becks are used, in which the materials, along with water are placed, and heated to from 80° to 90° C., a current of carbonic acid gas being passed through. By this means liquors of a gravity of from 5 ½° to 11° Tw. according to the nature of materials used are obtained. The liquor passes into a settling and cooling tank; when cold it is then passed into a refrigerating apparatus, where it is cooled to 2° C., and is kept at this temperature for about half an hour. The tannin and extractive matters are precipitated out, and are separated by filtering through a filter press; addition of 0·5 per cent. of zinc sulphate renders the clarification more complete. The amount of tannin in the liquid is then determined, and the total weight in the mass to be treated is calculated.

For every kilo, of tannn thus found, M. Villon adds to the liquor 2½ kilos. of pure crystallized sulphate of zinc, which has been previously dissolved in five times its weight of hot water.

The mixed liquids are transferred to a closed vat fitted with an agitator. Into this is passed a current of gaseous ammonia, obtained by decomposing 2½ kilos. of ammonium sulphate for each kilo. of tannin in the liquid. Any excess of ammoniacal gas is passed into another vat of liquid.

The ammonia displaces the oxide of zinc in the sulphate, which then combines with the tannin to form a zinc tannate, which is insoluble in a neutral or ammoniacal solution. The liquid in the vat is heated to boiling by means of a steam coil during the time the current of the ammonia gas is passing. Zinc tannate is precipitated and separated from the liquor by means of a filter press; it is washed first with hot ammonia liquor, then with cold ammonia liquor. and, finally, with cold water. The liquor is passed in cast-iron pans, where it is treated with lime to recover the ammonia, which is used over again in a subsequent operation. The zinc tannate is stirred up in five times its value of water and decomposed with dilute sulphuric acid, when zinc sulphate is formed and tannin is set free. Then to separate out the zinc sulphate from the liquid, a solution of Barium sulphide is gradually added, until no further precipitation occurs. There is formed zinc sulphide and barium sulphate, and both being insoluable are precipitated; they are then filtered off and the tannin solution is obtained in a condition ready for use.

In this manner, extracts of tannin can be obtained of from 14°—to 22° Tw. in gravity and containing from 20 to 30 per cent. of tannin free from extractive matter and almost oolourless. These will be found useful in dyeing light tints.

Monsieur August Foelsing proposes to utilise electricity for decolourising tannin extracts. These are made as usual of a specific gravity of 40° B, from the various kinds of tannin matters—myrabolams, quebracho, mimosa, divi-divi, chestnut, etc. To every 1,000 litres of such extract 500 grams of oxalic acid are added and 2 kilograms of salt, each previously dissolved in water; the mass is heated to 60° C. and a current of electricity is is passed through; this decomposes the salt and oxalic acid, which (although it is not so stated) will have a decolourising effect, and at the same time it causes the precipitation of resinous, albuminous and any colouring matter in the extract in the form of a flocculent precipitate. When the separation is complete the liquid is filtered to separate out the precipitate leaving the liquid, which contains the tannin perfectly clear and ready for immediate use.

THE SEPARATION OF BARIUM FROM STRONTIUM.

By R. Fresenius.

THE examination of the chromic acid method led to the confirmation of many of Schwietzer's statements. (From the Catalogue of the University of the State of Missouri, Contributions from the Laboratory of the State University, 1876, Part I., Determination of Barium.) Barium chromate does not dissolve in water containing acetic acid when so much ammonium chromate is present that only dichromate and acetate of the alkali are present. Dried at 110°, this substance retains 0·5% of water, it does not decompose when gently ignited, and barium chromate adhering to a filter paper can be weighed without loss after burning the paper and gently igniting the ash. The determination of barium by precipitation with ammonium chromate gives perfectly satisfactory results. This metal cannot, however, be completely separated from strontium by a single precipitation as barium chromate under any circumstances whatever. Such a separation may, nevertheless, be effected by the following new method:—7·6085 grms. of barium chloride solution, corresponding to 0·2774 grms. baryta, and 13·4479 grms. strontium chloride solution, corresponding to 0·4864 grms. strontia, were diluted to 300 cbc., 6 drops of acetic acid added, and the heated liquid then mixed with 10 cbc. of a solution of 1 grm neutral ammonium chromate (the solution of acid ammonium chromate being only so far neutralized with ammonia, that it had an acid rather than an alkaline reaction), and allowed to cool and stand for an hour. The precipitate was then washed (mainly by decantation) with water containing ammonium chromate until the filtrate gave no further precipitate with ammonia and ammonium carbonate (100 cbc. were required), and the washing was then continued with hot distilled water (110 cbc.) until the washings only produced a very faint reddish brown colouration, with silver nitrate. The precipitate was then carefully washed back from the filter paper into the basin and the paper then treated with a little hot dilute nitric acid, which was added to the bulk of the barium chromate, and the whole of the precipitate then dissolved in a small additional quantity of hot nitric acid (in all 2 cbc. of acid were used). To the hot solution, diluted to 200 cbc., 5 cbc. of a solution of 1·55 grm. ammonium acetate were very gradually added, and then ammonium chromate added (10 cbc.) until the smell of acetic acid had disappeared.

After standing for an hour the supernatant liquid was filtered, the precipitate digested with hot water, the latter allowed to cool and then poured off, and the precipitate finally washed on the filter paper with cold water until neutral silver solution scarcely gave a reaction. In this way 0·4585 grm. ignited barium chromate was obtained, corresponding to 0·2768 grm. (0·0006 too little) = 99·78% baryta, and proved to be free from strontium. The latter was first precipitated as strontium carbonate and purified by a second precipitation in the form of sulphate; 0·8648 grm. strontium sulphate was obtained, corresponding to 0·4876 grm. (instead of 0·4864 grm.), = 100·25% strontia.

Official Memoranda.

(From the Board of Trade Journal.)

Concluded from Page 322.

THE UNITED STATES TARIFF.

MERCHANTS and others interested in the trade with the United States, and desirous of possessing information as to the import duties now levied in that country under the so-called "McKinley tariff," will find a full statement of the rates of duty on all classes of goods in the return relating to "Foreign Import Duties," which is expected to be issued almost concurrently with the current number of the *Board of Trade Journal*. Copies of this return may be procured at a small cost, through Messrs. Eyre & Spottiswoode's office for the sale of Parliamentary Papers in East Harding Street, London, E.C.

FRANCE.

Free Importation of Oil from Tunis.

The *Journal Officiel* for the 18th October publishes a decree of the French President authorising the importation into France, free of Customs duty, of 4,500,000 litres of olive oil of Tunisian origin and production.

DISCOVERY OF QUICKSILVER IN AUSTRIA.

The *Neue Freie Presse* reports the discovery of what promises to be a rich quicksilver mine at the little market town of Wippach in Carinthia. As long as 20 years ago children, while playing near the Wippach at low water, had been known to find the metal. Little attention seems, however, to have been paid to the circumstance until recently, when the visit to the neighbourhood by a mining engineer afforded Chief Justice Dolewz an opportunity of drawing attention to the fact, which was subsequently verified by a number of well-known officials from Trieste, who, on visiting the spot, succeeded with little trouble in getting quicksilver. It is said that as the metal is to be found at a depth of only one metre, mining operations could be prosecuted on the surface. The discovery of quicksilver at so slight a depth is phenomenal from a geological point of view. the metal being usually found in old geological formations.

THE PRODUCTION OF PLATINUM.

It is announced from Mexico, that M. Flavio Lobato, mining and chemical engineer, has discovered platinum in certain ores extracted from the mines of Las Yedras, in the State of Sinaloa. This news, if it is confirmed, will be of enormous importance to industry, more particularly as platinum is becoming scarcer, and realises an abnormal price.

The platinum mines, situated in the Oural mountains, contain, says the *Journal de la Chambre de Commerce de Constantinople*, important auriferous deposits; until recently gold in large quantities constituted the chief mineral working, and platinum was obtained at the same time without large supplementary expenditure. The richness in gold of the chief mines, Nisknée-Taglisk, and Gord-Blagodat has much diminished, and the preparation of platinum has become more difficult; such seems to be the explanation of the high price of platinum. A large number of miners have abandoned the mines, and have established themselves on the works of the Trans-Siberian railway.

GOLD PRODUCTION IN QUEENSLAND.

In a review of the annual report upon Queensland mining for 1889, the *Adelaide Observer* makes the following remarks:—

The annual report upon Queensland mining for 1889 is one of the most interesting official documents that have come before us for a long time past. It is a satisfactory record of progress, detailing a history of successful efforts and of growing prosperity and revealing facts gratifying alike to the people of Queensland and of Australia generally. Speaking only of gold mining, the first thing that engages attention is the fact that Queensland has advanced to the first place among the colonies in the production of this precious metal. The yield for the twelve months has been no less than 739,103 oz., being a net increase over the amount produced in 1888 of 257,460 oz. To Mount Morgan belongs the credit of the greater part of this abnormally high increase. That fabulously rich mine yielded during the year 323,542 oz. of gold, being an advance of more than 200,000 oz. over the total for 1888. Charters Towers follows with a yield of 165,552 oz., being an increase of 28,030 oz.; Gympie comes next with 115,590 oz., and then there is a tremendous drop, for the Croydon fields only produced 52,541 oz., and Ravenswood, the next in order, 15,719 oz. While Queensland's aggregate production was 739,103 oz., that of Victoria, which occupies the second position on the list, was no more than 614,839 oz. This, if we mistake not, is the first time for many years that Victoria has had to relinquish the pride of place to any of her Australian sisters, and even as it is she far outstrips all other competitors in this part of the world, for the aggregate return for New Zealand is set down at 203,211 oz.; for New South Wales at 112,948 oz.; for Tasmania, 33,050 oz.; while South Australia, with 20,000 oz, only heads Western Australia by about 4,500 oz. These figures are only approximate, but they give a fair idea of the relative positions in which the colonies stand as contributors in 1889 to the gold supply of the world.

Of the gold produced by Queensland during the year, 10,827 oz. was taken from alluvial fields and 728,816 oz. from quartz, showing as compared with the yields for 1888, a decrease in alluvial of 1,812 oz. and an increase of 257,460 oz. from quartz. The quantity of quartz crushed was 385,180 tons, so that the average was not less than 1 oz. 17 dwt. 20 gr. per ton, the average yield for 1888 having been 1 oz. 14 dwt. 11 gr. To obtain the 739,103 oz. the services of 8,955 miners were required. Of these, 8,350 were Europeans and 605 Chinese, the decrease as compared with 1888 being 396 in the one case, and 140 in the other. Setting down the price of the gold at the moderate figure of £3. 10s. per oz., the gross yield represents a value of £2,550,848., or an average for each miner of a sum of £284.

THE TRADE IN SULPHURIC ACID IN TURKEY.

According to the Belgian *Bulletin du Musee Commercial*, for October 4th, there is at present but a relatively unimportant import of sulphuric acid into Constantinople. In Turkey, as elsewhere, the trade in this article is in direct proportion to the development of the industries which make use of it. The manufacture of mineral waters, the dyeworks, the cloth factories belonging to the State, the electrical offices, such as telegraphs, fortifications, marine, and the jewellers' workshops are the principal clients. The annual consumption amounts to about 40,000 kilos. net, the value being about £2,000.

The Custom house administration makes no distinction between nitric acid and sulphuric acid, and returns general figures which make it impossible to give more than a roughly approximate division. The following table gives the amounts of sulphuric and nitric acid imported into Constantinople and into the other parts of the Ottoman Empire in the course of the year 1888-89:—

From.	To Constantinople.	Import Duties.	Other Parts of the Empire.	Import Duties.
	Kilogrammes.	Piastres.	Kilogrammes.	Piastres.
England	—	—	2,186	210
Austro-Hungary	3,993	521	13,832	2,116
Italy	—	—	58	21
Bulgaria	—	—	80	37
Tunis	—	—	510	59
Servia	—	—	64	14
France	88,229	7,193	42,751	4,299
Greece	—	—	30	9
	92,222	7,714	59,511	6,765

About four-fifths of the total importation concern sulphuric acid, of which 10,000 kilogrammes are used in the Imperial factories at Stamboul, Makrikeni, and Ismidt. Most of the sulphuric acid brought into Turkey comes from Marseilles, notably from the Rio Tinto Company and from the Saint Gobain factory. A certain important proportion of the consumption is indirectly supplied by England and Germany, through agents in London and Hamburg. For some little time past a house at Antwerp has been sending small quantities of sulphuric acid to Constantinople. The importation by way of Trieste and Galatz, from the Black sea, is much less than it was.

Steamers are apt to refuse to take large cargoes of this article, as being dangerous. There is therefore serious difficulty in importing it from London and Hamburg, as most of the steam navigation companies now decline to carry inflammable articles. If, however, they do consent to take sulphuric acid on board, it ought to be highly insured, as such articles are thrown overboard at the least threat of danger. The Austro-Hungarian Lloyd has a limit of 15 cases, beyond which it will accept no consignment of this acid. Sailing vessels are much more accommodating, and their freight is lower.

THE BREWING INDUSTRY IN BELGIUM.

The United States Consul at Brussels, in his last report, has the following information respecting the brewing industry in Belgium:—

The brewery industry in Belgium does not enjoy full liberty, owing to a severe fiscal regulation. The excise tax annually amounts to 14,000,000 francs. The last official census shows the existence of 2,635 breweries; accordingly, each brewery paid an average of 5,314 francs. Although the number of breweries has not increased during the past 30 years, the output has considerably increased. Thus, in 1850 there were 2,894 breweries, with a taxable area of 3,168,073 hectolitres producing 5,544,128 hectolitres of beer. In 1889 the breweries numbered only 2,635, having however, a taxable area of

4,826,175 hectolitres and yielding 9,516,648 hectolitres of beer, showing a difference in production of 3,972,520 hectolitres in favour or 1889.

During the past 40 years, the annual production has constantly increased. The quantity produced is, however, insufficient to supply the home demand, and, in consequence, a considerable quantity of beer is imported from Germany and England. The importation is annually decreasing in proportion as the yield of the home breweries increases. Thus, in 1885, Belgium imported from Germany 82,345 hectolitres of beer; in 1889 the importation amounted to only 46,952 hectolitres.

English beer finds ready sale on the Belgium market, and the annual importation fluctuates but slightly. In 1885 the importation amounted to 18,425 hectolitres, and in 1889 to 17,743 hectolitres.

The consumption of beer is constantly increasing, as it is the ordinary beverage of the poor as well as the well-to-do inhabitant.

From the data on the quantity produced per inhabitant in each province, it is seen that the average consumption per head is 1·72 hectolitres. Belgium annually exports about 4,000 hectolitres of beer in casks and bottles. France is the principal buyer, During the past four or five years the importation has amounted to about 1%.

WORKING MEN.—The number of labourers in the various breweries has increased about 22% since 1846. At that date 6,766 working men were employed. In 1889 the number amounted to 9,860 men. In 1846, in the 2,680 breweries, there were only 52 mechanical motors, of which 33 were steam of 281 horse-power. In 1889, in the 2,635 breweries, there were 685 steam motors of 9,411 horse-power, 16 hydraulic, and various other machines employed.

MINERAL RESOURCES OF URUGUAY.

The following information is extracted and translated by the Buenos Ayres *Standard* from "La Republique Orientale de l'Uruguay—Notice Historique et Statistique," by Col. Juan J. Diaz:—

The Republic of Uruguay has been gifted by nature with a vast mineral wealth, greatly aided by its geological formation. Mines of argentiferous lead, coal, copper and antimony, silver and gold are found; the latter are found in the departments adjacent to Brazil. Mr. Lettson, the eminent English mining engineer, and an authority on the subject, states that the silver ore of Uruguay contains 87% of pure silver, copper ore 56%, and magnetic iron ore 72% of iron of best quality. The rivulets running down from the Cuchilla Grande carry native gold.

Copper is found in the streams of Cuareim and Arapey, and in the departments of Maldonado and Minas. Gold, silver, and lead mines are worked on a small scale in those departments, as also in the department of Tacuarembo, where several companies with considerable capital have been formed to work, on a larger scale, the rich auriferous quartz which is there found. Coal is found in Maldonado, Minas, and Cerro Largo. Iron ore is found in several regions of the country. It is in great part magnetic; it yields from 70 to 75% of iron. Up to the present date, the working of the mines, which constitute the future wealth of the country, has been neglected, owing to the lack of workmen and the greater advantages offered in the cattle-breeding industries.

The existence of gold in certain regions of Uruguay was confirmed more than a century ago. According to Fuentes and other historians, gold has already been found last century in the mountains of Arequita, Penitentes, Campanero, Mohoma, and Marincho. At the time the mineral extracted from those places was essayed in the Royal Mint of Madrid, yielding the following results: 4 samples of native gold and 2 of quartz weighing 73 grammes 10 carats. Two other pieces 19½ carats yielding 1 gramme on 36; the standard being 21 carats. Gold, according to the previously mentioned historians, is found in veins of quartz and in nuggets. More recent and deeper studies have confirmed the assertions of Fuentes and other writers of the 18th century. Mr. Barrial Posada, who, besides his deep knowledge, has the experience of many years' study of the mining regions of South America, has shown in the most positive manner the great wealth of the auriferous region of Tacuarembo—mining region we should say, for not only gold but other metals are found there.

MANGANESE OXALATE.—Manganese oxalate—$MnC_2O_4 + 2H_2O$, —appears as a white crystalline powder, which is but very slightly soluble in cold or hot water. According to John Casthelaz, it is decomposed at 150° C. (302° F.), into carbon dioxide, carbon monoxide and manganous oxide. The same decomposition takes place also in the presence of fatty oils, whereupon the manganous oxide dissolves in the oil and imparts to it a strong siccative property; at the same time, the boiling point of the oil is lowered, whereby almost colourless products may be obtained. These qualities apppear to make manganese oxalate a valuable agent for the preparation of drying oils; better results are said to be obtained with it than with the sulphate, borate, or acetate of manganese.

Selected Correspondence.

THE VULCANISATION AND DECAY OF INDIA-RUBBER.

The following letter appears in the *India-Rubber Trades Journal*:—

SIR,—As a maker of cloth for rubber proofing, I have read with great interest your report of the remarks by Mr. William Thomson, F.R.S. Ed., F.C.S., on the above subject.

The fact that Mr. Thomson totally rejects some of the most widely accepted maxims of the proofing trade, must be my excuse for asking a portion of your valuable space.

Being simply a manufacturer, and not a profound chemist entrenched behind the formidable initials which follow Mr. Thomson's name, I do not presume to cross swords with him, but merely express some of the difficulties which an outsider has in accepting his theories. This I do in the hope that Mr. Thomson, or some other qualified person, may give us more light on this mysterious subject. The necessity for the more complete ventilation of this important matter is evidenced by the constantly increasing amount of proofed cloth now deteriorating. This if allowed to continue, will destroy the public confidence in rubber proofing, and prevent the development of the trade for many years.

A few years ago, if one asked a practical proofer what must be avoided in the manufacture of cloth for rubber proofing, the invariable reply was "Avoid oils or fatty matter, as they destroy the rubber." As the trade developed, and the antagonism between oil and rubber became better known, proofers began to insist more strongly on cloth being free from oil, and now their order sheets carry the express stipulation that goods must not contain more than two per cent. of oil.

Against this unanimous finding of the proofing trade, Mr. Thomson uplifts his voice and says that oil, if vulcanised, actually preserves the rubber instead of destroying it.

If Mr. Thomson is right, then every worker in the trade, theoretical or practical, has been going blindly in the wrong direction for years. If this is so, then every manufacturer who has paid exorbitant claims for greasy cloth, has suffered great injustice.

If vegetable oil, when vulcanised, acts as a preservative to rubber, then the twenty, forty, or sixty per cent. of vulcanised rape or linseed oil, as at present used for substitute, is perfectly harmless, and with it the one to one and three-quarters per cent. of oil left in the cloth by the manufacturer, as it is also a vegetable oil, and it is vulcanised at same time as rubber after proofing. Though extremely anxious that Mr. Thompson's tests will be authenticated by experience, I fear he will find it difficult to prove that not a single mixer or chemist in the rubber trade knows his business. He must also explain away the fact that, since the use of oil substitute has become general, the amount of proofed cloth gone wrong has enormously increased.

After proving to his own satisfaction, that oil is rather friendly to rubber than otherwise, Mr. Thomson proceeds to say that copper salts, if present with oil, are very destructive to rubber. An equally eminent chemist, Mr. R. R. Tatlock, F.R.S.E., F.I.C., F.C.S., asserts that the effect of oxide of copper on oil is to form an insoluble copper soap, which is neutral, and rather preservative than detrimental to rubber.

Mr. Thomson illustrates his remarks regarding the effect of copper by experiments. Having seen the proofed cloth which had deteriorated, and Mr. Thomson's three tests, I procured samples of the original unproofed cloth, and also of the proofing gone wrong, and had them carefully analysed with the following results.

There were four patterns in the original cloth, and after testing each for oil, copper, chromium, and free acid, it was found that the highest proportion of metals obtainable was ·08 per cent. of oxide of copper, and ·29 per cent. of oxide of chromium; the greatest quantity of oil, in a different sample, was 1·82 per cent., while free acid was quite absent from all.

In the proofed cloth, deteriorated, was found sufficient free sulphuric acid to destroy proofing, cloth, and dye.

Now, if the worst results of the four patterns had been contained in one, giving ·08 per cent. of oxide of copper with 1·82 per cent. of oil, could these, in combination, possibly develop into the very large quantity of free sulphuric acid found in the proofed cloth?

Is the secret of deterioration, in this instance, not disclosed by Mr. Thomson's final sentence in paragraph three of his paper, where he says: "In rubber vulcanised by the cold process I have found free sulphur to be present?"

Has not the free sulphur, left after vulcanising, formed, with the oxygen of the air, the free sulphuric acid found in the cloth?

Is not this more probable than the scarcely appreciable quantity of copper which Mr. Thomson points out as the destructive agent?

These questions are asked with the deep humility which the uninitiated feel, when approaching the mysteries of chemistry.

It is well known that good shades of black or brown cannot be dyed fast without the use of metal mordants, therefore, if Mr. Thomson is right in his assertion that ·08 per cent. of oxide of copper is sufficient to destroy rubber, then proofers are asking an impossibility, and must take the risk of either colour or proofing, as no dyer will guarantee fast black or brown, in acceptable shades, to be even as free from metal mordants as the sample Mr. Thomson objects to.

If any expert in chemistry can produce a good black or brown, fast for light and milling, without the use of metal mordants, his fortune will be made, as this result has not yet been attained by dyers.

In conclusion, I would point out one or two of the difficulties which the cloth manufacturer is expected to overcome.

All practical proofers positively affirm that oil destroys rubber. An eminent chemist says: "Oil, if vulcanised, as it is in curing process, is actually preservative, but small quantity of copper salts, if oil present, is very destructive." Another equally eminent chemist states that copper, with the oil, forms insoluble soap, and is neutral or friendly. Now which of these three authorities is the cloth manufacturer to believe?

If those who are making and using the proofing cannot agree with their scientific advisers as to what sends rubber wrong or keeps it right, why is the cloth manufacturer, who is rigidly excluded from all knowledge of materials and quantities used in proofing, expected to pay when the proofing, for which he is not responsible, goes wrong?

Would it not be possible, in the interest of this great industry, to arrive at a fixed standard of purity for cloths made for proofing purposes?

If proofers and their chemists would clearly state what kinds and quantities of oils and metal mordants are dangerous, then manufacturers, by adapting their cloths to the known requirements of the trade, might in some measure help to save an industry which is speedily losing the confidence of the public.

Trusting that others better qualified than writer may take up this matter,

I am,

MANUFACTURER.

Parliamentary Notes.

PRIVATE MEMBERS' BILLS.

The following bills are to be introduced by the members whose names are attached :—

Mr. W. Abraham (Rhondda): Bill to restrict the hours of labour in mines to eight per day.

Mr. E. Robertson: Bill to amend the law of conspiracy.

Mr. P. Morgan: Resolution in favour of the creation of a department for the control of mining industries.

Mr. E. Knatchbull-Hugessen: Bill to amend the law relating to the rating of machinery.

Mr. Causton: Bill to regulate and limit the power of the London water companies in respect of their charge for the supply of water.

Mr. Bruce: Bill to provide for the supply of water by meter for domestic purposes within the London area.

Mr. P. J. Power: Bill to amend the franchise of Ireland.

Sir W. H. Houldsworth: Bill dealing with the registration and inspection of steam boilers.

Sir H. Roscoe: Bill to amend the law relating to technical instruction.

Mr. Oldroyd: Bill to amend the Trust Investments Act, 1889.

Mr. Baird: Bill to provide for the better prevention of and insurance against mining accidents in Scotland.

Mr. Burt: Bill to amend the Employers' Liability Act.

Mr. Atherley Jones: Bill to amend the Employers' Liability Act.

Mr. Seton-Karr: Bill to provide that persons in charge of steam-engines and boilers on land shall hold certificates.

Mr. Brunner: Bill to provide compensation to owners of property suffering from the subsidence of ground caused by the pumping of brine.

Mr. Pickard; Bill to amend the Coal Mines Regulation Act.

Mr. Graham: Bill to limit the hours of labour to eight per day in all trades and industries.

Mr. Channing: Bill to prevent fraud in the manufacture of artificial manure and other materials used in agriculture.

Sir W. H. Houldsworth (on behalf of Mr. Hoyle): Bill to amend the Companies Act, 1862.

Mr. Dixon-Hartland: Bill for the protection of electric lighting property.

Correspondence.

ANSWERS TO CORRESPONDENTS.

C.H.N.—The sample referred to in your letter has not arrived.

P.M.H.—Acetate of soda and hyposulphite of soda, we do not know the proportions.

J.H.—You neglected to boil off the ammonia, had you done so your difficulty would not have occurred.

W.F.H.—Procure an elementary text book on chemistry.

G.F.—Oldbury, but we doubt whether you could see the process.

C.W.H.J.—Magic lanterns are not in our way.

R.P.G.—Hooper's work on "Brewing" may answer your purpose.

M.G., ALPHA, H.H.J., B.T.—Advertisements.

NOTICE.

WE have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under :—

December 2nd.—"River Pollution."
February 3rd.—"Chlorine Production."
March 3rd.—"Sewage Treatment."

At the next lecture, on "River Pollution," the chair will be taken by F. H. Walmsley, Esq. Chairman of the Rivers Committee of the Salford Corporation.

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

Trade Notes.

CARBAZOL YELLOW.—Carbazol yellow, of the Badische Anilin und Soda Fabrik, is dyed on wool like alizarin dyestuffs upon a chromium mordant, with 1½ per cent. carbazol yellow, but it must be borne in mind that the dyestuff does not stand the action of acids like galloflavine, and can, therefore, not be used for wools which must be carbonised, or dyes which are to be fast to acid.

CARBOYS FOR ACIDS.—A recent American patent claims the combination, with a carboy or vessel of glass or other suitable material containing nitric or other powerful acid and the frame or box within which the same is inclosed, the space between such box and the carboy being packed with mineral wool or other suitable fire-proof soft packing material, of a packing of plaster-of-paris around the neck of such carboy, substantially as and for the purposes shown and described.

THE IRIDIUM LIGHT.—Upon a suitable plate or support, such as wax, the form of the desired filament is pencilled with plumbago; this is placed in an electrical iridium bath. When a film of sufficient thickness is deposited upon the stenciled design, the filament is peeled off from the beeswax and the plumbago brushed off the back. Iron wires are used as conductors. The filament is incandesced in the atmosphere, as it is practically non-combustible, or, for security against breakage, it may be incandesced in any suitable gas or in a vacuum.

Market Reports.

THE LIVERPOOL COLOUR MARKET

Colours are without much change this week. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire: common, 40s., medium, 50s., best 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt, Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

TAR AND AMMONIA PRODUCTS.

The Benzol market is very steady for prompt delivery, and 4s. 8d. to 4s. 9d. for 90's, and about 3s. 7d. for 50/90's may be given as to-day's values. January to June deliveries can be bought at 4s. 6d. and 3s. 6d. respectively. Other tar products continue steady, and there is a good demand all round. For anthracene there is a very fair enquiry at 1s. 5d. for 30% A, and 1s. 1½d. for 30% B. The pitch market is in good figure at old rates.

The sulphate of ammonia market has experienced a further decline, prices having been run down to £10. 11s. 3d. at Hull and Leith, it being rumoured that as low as £10. 10s. has been accepted at this last port. There is, however, a slightly steadier feeling now, but it is impossible to say what the next move will be, the speculators having so much control over the market. There is more inclination to operate for forward delivery now that prices have been depressed, but there are few makers will listen to overtures at the prices which are obtainable now. Beckton make is selling at £10. 15s., while London outside makes have fallen to £10. 12s. 6d. The fall has been entirely due to the operations of the dealers, and makers have to congratulate themselves that they have been parties to this great "bear" movement.

MISCELLANEOUS CHEMICAL MARKET.

Steady demand for all products in the alkali trade, prices continue firm. Bleaching power is strong at £6. 12s. 6d. on rails for prompt and forward, there being only an unimportant quantity in second hands at lower price. Soda ash very firm, and all the makers are well sold. Prices 1 1/16 to 1⅛ per deg. Soda crystals £3. 7s. 6d. per ton in casks. Bicarbonate £7. 15s. to £8. Caustic soda 70% £11. 10s. per ton. A considerable amount of business has been done in sulphur for 1891, and price is now £4. 7s. 6d. to £4. 10s. per ton in bulk on rails. Muriatic acid and vitriol are in good demand in all quarters. Sulphate of copper remains steady at £18. 15s. to £19. for January-March delivery, but no business of importance is yet being done. Acetates of lime are firm, but prices are without change. A fair amount of business is being done for early delivery. Acetate of soda steady. Acetates of lead rather firmer. Corbolic acid crystals only selling in small lots and at lower prices. All sundry chemicals for textile trades are rather quiet, but there are no important changes in values. Carbonate of potash and caustic are still only obtainable in limited quantity for prompt delivery, and prices are firm.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron rose 3d. to 6d. Scotch warrants closed at 48s. 9½d. cash and 49s. 1½d. one month. Middlesbrough, 45s. 3d. cash; hematite, 56s. 1d., cash. Copper fell, 10s. Chili bars, G.O.B.'s and G.M.B.'s closed at £55. 12s. 6d. to £56. cash, and £56. 2s. 6d. to £56. 10s. three months. Tin lower; Straits closed at £90. 10s. to £91. cash, and £91. 5s. to £91. 15s. three months; English ingots, £95. Lead: Spanish, £13. 7s. 6d.; English, £13. 15s. Silesian Spelter: ordinary, £24. 5s. to £24. 10s. Quicksilver, first hands, £10.; second hands, £9. 7s. 6d. Copper shares: Cape 4 11/16; Mason and Barry's account, 7 1/16 to 7 1/8; Rio Tinto's account 22¼ to 3.

GLASGOW, WEDNESDAY.—Market firm, with good business. Scotch done at 48s. 7½d., 48s. 11½d., and 48s. 10d. cash, also at 48s. 11d., and 49s. 2½d. one month; closing buyers at 48s. 10d. cash, sellers ask 1d. more Middlesbrough closes with buyers at 45s. 3d. cash, sellers ask 3d. more. Hematite done at 56s. to 56s. 3d. cash, also at 56s. 1½d., to 56s. 6d. one month; closing buyers at 56s. 1½d. cash, sellers ask 56s. 3d.

WOLVERHAMPTON, WEDNESDAY.—Restricted operations are continued. Cinder pigs quoted 42s. 6d., part mines 46s., all mine hot blast 70s, and cold blast 100s. A quiet business was done in manufactured iron. Marked bars £8. 10s., merchant bars £7. 5s., and common £6. 5s. Sheets (singles) were £7. 10s., doubles £8, and lattens £9.

CLEVELAND IRON TRADE.—By Mr. Waterhouses's return for September and October, rendered on Wednesday to the North of England Iron Trade Board of Arbitration, from an examination of the contracts and books of different firms, the production of plates, bars, rails, and angles is 46,000 tons, against 41,000 in July and August. The net average price is £6. 0s. 9d., a rise of nearly 10d. per ton. This leaves wages unchanged on the sliding scale. By April wages had risen 25 per cent. from the minimum of 1888. In the summer a 7½ per cent. reduction occurred, but the decline is now arrested.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

The weakness of sulphate of ammonia, existing for the past month or more on a constantly increasing scale, has, since the date of last report, become more pronounced than ever, and it constitutes about the sole exciting feature of an otherwise rather easy-going general market. Although two or three of the strongest makers here have been applying the drag strenuously, that has not averted a further very heavy fall, and it seems amply confirmed that business has been done at £10. 10s. Leith, with the undisguised apprehension on the part of holders, that the worst has not yet been touched. There has been no sulphate collapse to compare with it back over a period of years. In the paraffin section the relaxation suspected last week has become undisputable, but the falling away is as yet but trifling. Soft scale is down a fraction, but hard scale and paraffin wax stand, nominally at least, at the old prices. In general chemicals there is only a limited business, but prices for the most part are maintained, with in the case of bleaching powder a further gain, and a rise also in bicarbonate of soda. Sulphate of copper is easier. Nitrate of soda also is cheaper. In bichromates the business is still on an unsatisfactory scale for makers. The servants of the various railway companies in Scotland, seem resolved on an early standout, which of course means trouble to all sorts of manufacturers and traders.

Chief prices current are: Soda crystals, 56s. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 2½%, Tyne; caustic soda, white, 76°, £13. 10s., 70/72°, £11. 10s., 60/62°, £10. 5s., and cream, 60/62°, £9. 17s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £8., and 1 cwt. casks, £8. 5s., net Tyne; refined alkali, 48/52°, 1⅜d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £30., and boracic acid, £37. 10s, net Glasgow; bleaching powder, £6. 10s. to £7., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5⅜d., less 5% any port; nitrate of soda 7s. 9d. to 8s.; sulphate of ammonia, £10. 10s. to £10. 15s., f.o.b. Leith; salammoniac, 1st and 2nd white, £37. and £35., less 2½% any port; sulphate of copper, £18. 5s., less 5% Liverpool; paraffin scale, hard 2¾d., and soft 2⅝d., per lb; paraffin wax, 120°, semi-refined, 3⅝d. to 3¾d.; paraffin spirit (naphtha,) 8d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 5s. to £6. 10s., and 890/895°, £7. 10s. to £8. Week's imports of sugar at Greenock, were 47,075 bags.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market has been quiet this week, transactions for forward delivery not being so numerous. For prompt the market is very firm. For special brands of bleaching powder a slight advance on the Union price is asked. There is a good demand for silicate of soda, and price has been advanced.

Recovered sulphur is again dearer by 5s. per ton, making a rise of 10s. per ton during the last fortnight. Hyposulphite of soda also dearer by 10s. a ton.

The following are the market quotations of to-day:—

Bleaching powder, in softwood casks, £6. 15s. 0d. per ton; in hardwood casks, £7. per ton, both less 3½%. Caustic soda 77%, solid, in drums, £12. 5s. per ton; ground and packed in 3-4 cwt. barrels, £16. per ton, nett; 70%, £11. 10s. per ton, less 3½%; soda ash, 48/52%, 1⅜d. per degree less, 3½%; white alkali, 1⅜d. per degree, less 5%; soda crystals, 56s. per ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; ground and packed in casks 53s. per ton, both less 3½%; recovered sulphur, packed in 2 cwt. bags, £5. per ton, nett; chlorate of potash, 5½d. per lb., less 5%; silicate of soda, 75° Tw., £2. 15s. per ton; 100° Tw., £3. 10s. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. 10s. per ton; in 5-7 cwt. casks, £6. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £8. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

There is practically no change to report in the price of small coals this week; Northumberland steam quoted from 5s. to 6s. per ton, and Durham small 6s. 6d. to 7s. 6d. per ton. The application for an increase of 20% in wages made by the Durham miners a few weeks ago has now been considered, and an advance of 5% granted, to commence from the pay ending 29th December.

THE LIVERPOOL MINERAL MARKET.

A good demand has been experienced during the whole of the week; and business has been done at firm prices. Manganese: Arrivals continue small, while stocks have been pretty heavily drawn from, hence prices are well maintained. Magnesite: Sales of raw lump continue exceedingly slow, and it can be bought at almost any figure, nominally 30s. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £12. 10s. Bauxite (Irish Hill brand): In consequence of the deodorising and other processes increasing, the demand is still stronger, and production can scarcely keep pace with the requirements; prices, therefore, are firmer; lump, 22s.; seconds 18s.; thirds, 14s.; ground, 35s. French chalk: Arrivals have somewhat improved; prices unaltered; G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate quiet; sulphate in increased demand, best qualities "Angel White," No. 1, 70s; No. 2, 60s to 65s; No. 3, 45s. Pumicestone: Lump and ground more inquired for. Iron ore in fair demand; manganiferous in request, and prices firm. Santander, 9s. to 10s. 6d., f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Emerystone: Best brands in good demand; No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal brisk, at full prices. Chrome ore steady; higher grades being asked for. Antimony ore and metal sought for at last prices. Asbestos in strong demand, especially Canadian rock. Potter's lead ore: "standard" brands improving in figure; smalls, £13. to £14.; selected lump, £15. to £16. Calamine: Good qualities in demand at advanced prices. Strontia sulphate (celestine) inquired for, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar; a steady business doing; English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, quieter. Plumbago firm; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, 20s. to 22s. 6d. Ground mica, £50. China clay easier; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), inquired for, finest quality 22s.

REPORT ON MANURE MATERIAL.

The market for both phosphatic and nitrogenous material continues quiet, and without important change in values.

For hot-air-dried South Carolina River phosphate rock, 11d. per unit still asked for cargoes c.i.f. to U.K., but there would probably be sellers at ½d. per unit less. For land rock, 10d. per unit is probably the nearest value. Navigation having now closed in the St. Lawrence, business in Canadian may be considered closed for the present season. We do not hear of any important business in Continental phosphates, but the tendency of the market is in buyers' favour.

Business has been done in River Plate bones for U.K., but the price is not reported. The value can hardly now be considered over £5. 2s. 6d. to £5. 5s., according to position. East Indian bone meal remains steady at £5. 7s. 6d. per ton for fair average quality, for shipment. Crushed East Indian bones are worth about £5. 5. per ton, delivered ex quay, Liverpool. Common grinding bones are still in demand, and any near at hand parcels would probably fetch over £5.

Advices from the West Coast having been received, reporting November shipments as considerably less than had been previously estimated, the market is quite 3d. per cwt. up on the Continent, and in the U.K. it is decidedly firmer. Spot value continues to be 7s. 9d. per cwt. for low test, up to 8s. 1½d. for refined parcels. Due cargoes are worth 7s. 9d. per cwt., and October–November shipments about 8s. per cwt. delivered U.K.

We do not hear of any fresh business in River Plate dried blood, but under 10s. per unit, would be accepted. Nearest value of home prepared is 10s. 3d. per unit, f.o.r., according to position of works. Superphosphates remain quiet, but firm at 50s. per ton, in bulk, delivered f.o.r. at works.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

I. Nicholson and J. Roberts, under the style of I. Nicholson and Co., Hightown, Liversedge, manufacturing chemists.

Locke and Smith, Camden-street, Camden Town, and Birkhampstead, brewers and maltsters.

J. Law and J. Morton, under the style of J. Morton and Co., Rishworth, near Halifax, paper manufacturers.

King and Palmer, Odiham, brewers and maltsters.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Material for use in Gas Fires. Unsworth & Richmond, Ld., and W. Unsworth. 18,047. November 10.

Apparatus for Clarifying Liquids. T. Thorp. 18,050. November 10.

Stopper Filling Machine for Ærated Waters. W. Bruce. 18,051. November 10.

Water Indicators for Steam Generators. J. Lefebvre. 18,060. November 10.

Utilization of Cupreous Liquors. C. Hopfner. 18,080. November 10.

Electric Switches. C. E. Knowles. 18,103. November 10.

Manufacture of Heating Gas. S. Pointon. 18,115. November 11.

Substituting Carbonic Acid Gas for Air in Casks on Draft. A. G. Hopkins. 18,123. November 11.

Air Compressors. W. Tattersall. 18,125. November 11.

Metal Casks. S. S. Field. 18,146. November 11.

Alkaline Nitrites. M. Goldschmidt. 18,152. November 11.

Electric Pressure Indicator. C. H. Gray. 18,158. November 11.

Straining or Screening Paper Pulp. W. P. Thompson. 18,169. November 11.

Manufacture and Tempering of Steel.—(Complete Specification.) W. P. Thompson. 18,171. November 11.

Smoke Prevention. W. H. Hollins. 18,172. November 11.

Solutions for Facilitating the Combustion of Fuel. A. J. Boult. 18,175. November 11.

Primary Batteries. Sir C. S. Forbes, Bart. 18,180. November 11.

Electrical Measuring Instruments.—(Complete Specification.) H. H. Lake. 18,186. November 11.

Apparatus for Recovering Soda.—(Complete Specification.) L. D. Armstrong. 18,187. November 11.

Improvement in Paper Making Machinery. W. McDougall. 18,197. November 11.

Blowing Fan.—(Complete Specification.) G. Barnett. 18,204. November 12.

Commutator for Dynamos and Motors. H. Davis and A. H. Stokes. 18,206. November 12.

Waterproof Garments. I. Frankenburg. 18,216. November 12.

Extraction of Gold and Silver. W. D. Bohm. 18,235. November 12.

Vacuum Boxes for Paper Making Machines. W. Smart. 18,236. November 12.

Chlorine and Soft Burnt Magnesia. F. M. Lyte. 18,240. November 12.

Production of Anthranilac Acid. O. Imray. 18,246. November 12.

Electrolysis. J. A. Mays. 18,248. November 12.

Obtaining Vegetable Fibres. P. W. Nicolle and J. Smith. 18,284. November 13.

Feed Water Heaters. C. R. Bonné. 18,290. November 13.

Electric Switches.—(Complete Specification.) B. M. Drake and J. M. Gorham. 18,292. November 13.

Improvements in Boiler Tubes for Preventing Corrosion and Incrustation. C. A. Fuge. 18,320. November 14.

Steam Boiler Water Gauges. D. B. Morison. 18,326. November 14.

Production of Oxygen and Hydrogen by Electrolysis. W. R. Lake. 18,339. November 14.

Manufacture of Combustible Gas. H. Guyon and L. Métai. 18,360. November 14.

Wool Scouring. C. Campbell and H. D. Shaw. 18,375. November 14.

Tanning. L. A. Groth. 18,385. November 14.

Improvements in Sewers. F. B. Hill. 18,399. November 14.

Electric Switches. L. A. Davies. 18,409. November 15.

Charging Inclined Gas Retorts. G. B. Falconer. 18,419. November 15.

Filling Receivers with Gas under Pressure. J. H. Parkinson. 18,445. November 15.

Means of Producing Liquid Spray. F. E. Beeton. 18,447. November 15.

Preventing and Removing Incrustation in Steam Boilers.—(Complete Specification.) J. L. Wade. 18,451. November 15.

New Companies.

Electricity and Electrical Engineering Newspaper Company, Ltd.—This company was registered on the 18th inst., with a capital of £500., in £10. shares, to establish and work a newspaper in the interests of electrical science in all branches. The subscribers are:—

	Shares.
Wm. Swan Sonnenschein, 62, Russell-square, publisher	1
H. Wigham, Uplands, East Sheen, publisher	1
R. O. Smith, 73, Eaton-square, publisher	1
F. C. Tilney, 126, Corbyn-street, N., clerk	1
Julius Maier, Ph. D., 23, Melrose gardens, W.	1
F. D. Summers, 13, Oberstein-road, Wandsworth, private secretary	1
G. Newnes, M.P., Wildcroft, Putney-heath	1

Electrolytic Syndicate, Limited.—This syndicate was registered on the 17th inst., with a capital of £100,000., in £1. shares, to carry on business as miners, metallurgists, smelters, and electricians, and for such purposes to adopt agreements with Wm. Elmore, Arthur Cooper, John Fraser, and Woodhouse and Rawson United, Limited, respectively. The subscribers are:—

	Shares.
J. Jepson, Cosgrove Priory, North Hants, barrister	1
Wm. Elmore, 47, Clapham-road, electro metallurgis	1
J. Thomson Cooper, Cregg, Nightingale-lane, S.W., merchant	1
F. Safford, 2, Garden-court, Temple, barrister	1
S. Evans, Lonsdale-chambers, Chancery-lane, merchant	1
W. J. N. Tippitt, 11, Maiden-lane, E.C., solicitor	1
W. J. Peck, Redcar, accountant	1

ERNEST SCOTT AND MOUNTAIN, LIMITED.—This company was registered on the 17th inst., with a capital of £70,000., in £10 shares, to carry on the business of electrical and general engineers, and to adopt unregistered agreements with Ernest Scott (trading as Ernest Scott and Co.), E. H. Turner, and W. C. Mountain. The subscribers are :—

	Shares.
P. W. Bullock, 19, Portsea-place, Connaught-square	1
J. Aspinall, 34, Bowman's-buildings, Edgware-road	1
J. McNab, 8, Drapers'-gardens, stockbroker	1
W. Capel Slaughter, 21, Great Winchester-street, solicitor	1
A. H. Bartlett, 21, Great Winchester-street, solicitor	1
S. E. Preston, 21, Great Winchester-street, solicitor	1
D. Scott, 12, York-street, Manchester, merchant	1

ESHER LINOLEUM COMPANY, LIMITED.—This company was registered on the 13th inst., with a capital of £18,060., in £10. shares, to purchase the business of manufacturers of linoleum floor cloth, carried on by William Albert Le Mottee, Bernard Gilpin Haines and Alice Maud Mary Haines, trading as the Esher Linoleum Company. The subscribers are :—

	Shares.
E. W. Haines, 11, Ranelagh-avenue, Fulham, merchant	1
H. G. Leatherbarrow, 24, Constance-road, East Dulwich, clerk	1
C. E. Wilson, 23, Basinghall street, solicitor	1
N. L. Pocock, 4, Highgate-rise, solicitor	1
W. A. Le Mottee, 45, Nevern-square, merchant	1
R. A. Rothwaite, 17, South-hill-park-gardens, Hampstead, secretary to a hospital	1
H. N. Custance, 34, Tregunter-road, S.W.	1
H. L. Curtis, 119 and 120, London-wall, surveyor	1

FLEUSS' PATENT ICE MACHINES COMPANY, LIMITED.—This company was registered on the 14th inst., with a capital of £10,000, in £1. shares, to take over as a going concern, the Fleuss' Patent Ice Machine Company, Limited (incorporated 1887). The subscribers are :—

	Shares.
T. K. Bellis, 6, Jeffrey's-square, merchant	1
R. C. Ashby, 36, Ebury-street, S.W.	1
J. O. Spong Fernlea-road, Balham	1
J. Osborne Collier, Silverdale, Caversham, merchant	1
C. L. Constantinides, 6, Jeffrey's-square, E.C., merchant	1
J. W. Wallsgrave, 79, Handcrot-road, Croydon	1
B. K. Wilson, 49, Warrington-cresent, Maida-vale, W.	1

MIDDLEWICH SALT AND ALKALI COMPANY, LIMITED.—This company was registered on the 19th Inst., with a capital of £80,000., in £5. shares, to purchase 23 acres of freehold land, at Newton by Middlewich, Chester, with the salt deposits and other minerals underlying, and to erect works for raising and manufacturing salt, and other chemical products. The subscribers are :—

	Shares.
H. L Collingdon, 64, Baron's-court-road	1
E. L. Russell, 152, Wool Exchange, secretary of a company	1
T. Grover, 2, St. Stephen's chambers, Telegraph-street, contractor	1
J. Potier, 75, Paragon-buildings, Walworth, secretary to a company	1
L. C. Clovis, Stony Stratford, Bucks, engineer	1
W. R. Lacey, C.E., 20, Bishopsgate-street	1
C. F. W. Luz, 55, Moscow-road, Bayswater	1

PAY ROCK SILVER MINES, LIMITED.—This company was registered on the 19th inst., with a capital of £200 000., in £1. shares, to acquire the mines and mining property of the Pay Rock Milling and Mining Company, U.S.A. The subscribers are :—

	Shares.
W. Blaxall, 40, Alexander-road, N.	1
E. F. Forward, 18, Kingsgate-street, W.C.	1
H. Aylett, 27, Mildmay-park, N.	1
C. Badham, 25, Ellenborough-road, N.	1
C. Gould, 34, Whittington-villas, Highgate	1
J. Brown, 19, Swinton-street, W.C.	1
F. McCartney, 14, Albert-street, Barnsbury	1

YOUNG AND COMPANY'S BREWERY, LIMITED.—This company was registered on the 17th inst., with a capital of £380,000, in £100. shares, 1,500 of which are £5. per cent. cumulative preference shares, to acquire the business of brewers, recently carried on by the late Charles Florence Young, under the style of Young & Co., at Wandsworth, Surrey. The subscribers are :—

	Shares.
Mrs. M. A. Young, 22, Cranley-gardens, S.W.	1
C. F. Young, 22, Cranley-gardens, S.W.	1
J. A. Young, 22, Cranley-gardens, S.W.	1
R. T. Coupland, 6, Cresswell-gardens, S.W.	1
H. M. Leigh, 157, St. John's-hill, Battersea, brewer	1
W. H. Thorn, 21, Nicosia-road, Wandsworth, clerk	1
S. Thorn, 13, North-street, clerk	1

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.
Week ending November 15th.

Antimony Ore—

Japan,	48 c.	G. A. Witt
Spain,	90	Vivian, Younger, & Co.
,,	166	Pillow, Jones & Co.
,,	20	F. Williams
Melbourne,	11 t.	Bk. of N. S. Wales
Sydney,	10	Lark, Sons, & Co.
Portugal,	15	W. Robinson & Co.
Spain,	42	H. Emanuel
Portugal,	50	
Spain,	56 c.	B. & N. Whvs. Co., Limited

Acetic Acid—

Holland,	123 pks.	A. & M. Zimmermann

Arsenic—

Germany,	£23.	W. H. Cole & Co.

Alum—

Holland,	154 pks.	Ohlenschlager Bros.

Ammonia—

Belgium,	£153.	Weatherley, Mead, & Co.
,,	50	,,

Alkali—

France,	100 c.	Arnati & Harrison

Barytes—

Germany,	23 cks.	Constable, Henderson, & Co.
,,	46	D. Storer & Sons
Belgium,	97	W. Harrison & Co.
Germany,	23	,,
Holland,	44	Pillow, Jones, & Co.
Germany,	62	T. & W. Farmiloe
,,	74	H. Lambert
,,	47	W. Harrison & Co.
Belgium,	120	A. Zumbeck & Co.
Holland,	22	O'Hara & Hoar

Barium Chloride—

Germany,	£40.	Petri Bros.
,,	40	,,

Bromide of Iron—

Germany,	£350.	A. & M. Zimmermann

Borax—

Germany,	28 pks.	F. Slahlschmidt & Co.
,,	23	,,

Brimstone—

Italy,	200 t.	W. C. Bacon & Co.

Bones—

E. Indies,	54 t.	Culverwell, Brooks, & Co.
,,	200	Henderson Bros.
,,	300	G. Bennett & Sons
,,	175	Culverwell, Brooks, & Co.

Cobalt Ore—

Sydney,	190 t.	Union Lighterage Co, Ltd.

Copper Ore—

Spain,	49 t.	Baxter & Hoare

Caustic Soda—

Holland,	40 c.	Domeier & Co.

Cream of Tartar—

France,	5 pks.	Ross & Deering
Spain,	5	B. & F. Wf. Co., Limited
,,	2	W. C. Bacon & Co.
Holland,	45	Middleton & Co.
Italy,	6	W. C. Bacon & Co.
France,	10	W.V. Robinson & Co.
Italy,	6	W. C. Bacon & Co.
Holland,	5	Middleton & Co.
France,	1	E. W. Carling & Co.

Caoutchouc—

Germany,	4 c.	L. & I. D. Jt. Co.
Singapore,	214	Huttenbach & Co.
,,	3	L. & I. D. Jt. Co.
Germany,	59	,,
Zanzibar,	25	,,
,,	24	Clarke & Smith
,,	5	L & I. D. Jt. Co.
,,	42	Gray, Dawes, & Co.
Maranzary,	54	Kleinwort, Sons, & Co.
Zanzibar,	148	L. & I. D. Jt. Co.
Singapore,	196	,,

Chemicals *(otherwise undescribed)*

Holland,	35 pks.	Beresford & Co.
Germany,	35	T. H. Lee
,,	58	W. M. Burton & Sons
,,	50	T. H. Lee
France,	28	R. Womersley & Son
Germany,	180	A.& M. Zimmermann
Holland,	15	H. Boyce
Germany	11	G. Boor & Co.
,,	£20.	H. Lambert
,,	518	A. & M. Zimmermann
,,	10	Burgoyne, Burbidge, & Co.

Chemicals *(continued)*

Germany,	£7	Hernu, Peron, & Co.
,,	58	W. Burton & Sons
,,	101	T. H. Lee

Dyestuffs—

Orchella

Portugal,	55 pks.	L. & I. D Jt. Co.

Saffron

Italy,	3	M. Isaacs & Sons
Spain,	1	B. & N. Wvs. Co., Limited

Tanners' Bark

Belgium,	40 t.	J. J. Williamson & Son
,,	11	Leach & Co.
,,	50	Boutcher, Mortimore, & Co.

Cochineal

Teneriffe,	7 pks.	Bruce & White
Canaries,	7	J. Goddard & Co.
,,	20	W. M. Smith & Son
Las Palmas,	9	Bullard. King, & Co.
Canaries,	6	Swanston & Co.

Argols

Cape Town,	43	Hale & Son
Italy,	770	Thames S. T. Co.

Annatto

U. S.,	3	Henderson Bros.

Aniline

Holland, 1 pkg.		W. Hooton & Yates

Extracts

China,	35	L. J. Levinstein & Son
U. S.,	32	W. Burton & Sons
,,	65	W. W. Young
,,	14	Skilbeck Bros.

Logwood

Belize,	67 t.	A. Everingham & Co.

Cutch

E. Indies,	1,799 pks.	Anderson, Weber & Smith

Gambier

Singapore,	358 pks.	Elkan & Co.
,,	415	G. A. Witt
,,	374	R. & J. Henderson
,,	2,144	L & I. D. Jt. Co.
,,	333	Adamson, Gilfillan, & Co.
,,	415	J. T. & J. Powell

Valonia

Patras,	6 t.	Anning & Cobb
Smyrna,	41	,,
A. Turkey,	3	A. & W. Nesbitt
,,	8	Hicks, Nash, & Co.

Divi divi

Holland,	31 pks.	Kleinwort, Sons, & Co.
,,	207	Lambert & Strong

Indigo

Holland,	3 chts.	L. & I. D. Jt. Co.
E. Indies,	54	,,
Holland,	1	R. & P. Goldschmidt
E. Indies,	4	F.Stahlschmidt & Co.

Glucose—

U. S.,	30 pks.	165 cwts.	L. Sutro & Co.
,,	30	165	M. D. Co.
Germany,	20	160	,,
,,	25	243	Props. Chmbln's Wf.
France,	300	300	Trier, Meyer, & Co.
U. S.,	20	120	L. Sutro & Co.
,,	20	120	R. G. Hall & Co.
Germany,	35	290	J. Knill & Co.
,,	4	30	Dutrulle & Co.
France,	300	300	J. Barber & Co.
Germany,	100	100	Props. Chmbln's Wf.
U. S.,	55	330	R. G. Hall & Co.
,,	45	247	Page, Son, & East
Holland,	74	81	Props. Sun Wf.
,,	20	400	R. G. Hall & Co.

Gutta Percha—

Singapore,	89 c.	Huttenbach & Co.
,,	68	Kleinwort Sons & Co.
,,	249	R. & J. Henderson
,,	120	J. H. & G. Scovell
Belgium,	6	Jenkins & Co.

Guano—

Germany,	30 t.	J. Jenson & Co., Ld.

Glycerine—

Holland,	£69	Knight & Morris
,,	240	Spies Bros. & Co.
Germany,	280	Beresford & Co
,,	140	,,

Isinglass—

E. Indies,	8 pks.	L. & I. D. Jt. Co
,,	12	Clarke & Smith
Penang,	6	L. & I. D. Jt. Co.
Berbice,	1	D. Baird & Co.

Manure—
St. Valery, 210 t. Lawes Manure Co., Ld.
Montreal, 100 Couper, Millar, & Co.
France, 190 A. Hunter & Co.
St Valery, 125 Lawes Manure Co., Ld.
U. S., 5 A. Hunter & Co.
France, 200 H. Clarkson & Co.

Phosphate Rock
Tampa Bay, 650 t. Pickford & Winkfield
Montreal, 120 Anglo Cont. G. Wks.
,, 110 A. Hunter & Co.
,, 110 Soundy & Son
Belgium, 170 Walker, Howard & Co.

Magnesia—
Holland, 135 pks. Beresford & Co.

Nickel Ore—
Belgium, 12 t. Fellows, Morton & Co.

Naphtha—
Belgium, 15 cks. Lister & Biggs
,, 6 drs. Domeier & Co.
,, 5 Stei os

Plumbago—
Germany, 82 cks. Props. Scott's Wf.
,, 125 ,,
Holland, 166 Brown & Elmslie
Germany, 20 Props. Scott's Wf
,, 20 T. H. Lee

Pyrites—
La Laja, 940 t. G. Ward & Sons
Pomaron, 980 Mason & Barry, Ld.

Paraffin Wax—
U. S., 274 brls. H. Hill & Sons
,, 314 J. H. Usmar & Co.
,, 286 cs. H. Hill & Sons
,, 30 brls. ,,
,, 140 G. H. Frank

Pitch—
France, 95 cks. H. Hill & Sons

Potassium Permanganate—
Germany, 14 pks. Spies Bros. & Co.

Potassium Carbonate—
Germany, 9 pks. Beresford & Co.

Potassium Muriate—
Germany, 460 pks. Lawes Chem. Man. Co.

Phosphoric Acid —
Germany, 20 pks. Phillipps & Graves

Potassium Prussiate—
Germany, 300 pks. A. & M. Zimmermann

Potassium Sulphate—
Germany, 508 pks. Anglo Cont. G. Wks.
France, 17 Weatherley, Mead & Co.

Pearl Ashes—
France, 200 c. F. W. Berk & Co.
,, 200 Petri Bros.
,, 75 ,,

Stearine—
Germany, 185 cs. T. H. Lee
,, 12 bgs. H. J. Perlbach & Co.
Holland, 15 cks. J. H. Usmar & Co.

Saltpetre—
Germany, 24 cks. 5 bgs. P. Hecker & Co
,, 100 T. Merry & Son
,, 50 bgs. P. Hecker & Co.
E. Indies, 899 cks. Co-op. Lighterage Co.
,, 90 bgs. Ralli Bros.

Sodium Sulphide—
Belgium, £110 W. Balchin

Sodium Acetate —
Belgium, 9 pks. A. Zumbeck & Co.
France, 50 Barr, Moering & Co.

Sodium Silicate—
Belgium, 80 pks. Soundy & Son

Sugar of Lead—
Germany, £96 A. Zumbeck & Co.
,, 106 T. H. Lee
,, 55 Anderson, Becker & Co.

Tartaric Acid—
Holland, 20 pks. Middleton & Co.

Tartars—
Italy, £506 Harse & Co.

Tar—
N. Russia, 947 brls. W. F. Malcolm & Co.

Turpentine—
N. Russia, 101 brls. C. B. Leighton
Brunswick, 1,000 brls. Nickoll & Knight
,, 1,022 Game, Bowes & Co

Ultramarine—
Holland, 16 pks. Phillipps & Graves
Belgium, 10 cks. Arnati & Harrison
Holland, 6 Haeffner, Hilpert & Co.
,, 20 cks. Seaward Bros.

Uranium Oxide—
Germany, £72 H. Johnson & Sons

Verdigris—
France, £25 C. Bramlen

Zinc Oxide—
Germany, 60 brls. M. Ashby, Ld.
,, 50 ,,

LIVERPOOL.

Week ending November 18th.

Antimony Ore—
Smyrna, 1,401 bgs.

Acetic Acid—
Rotterdam, 14 btls.

Bone Ash—
Rio Grande do Sul, 210 t. Beckwith & Co.

Bone Meal—
Bombay, 2,515 bgs.
Kurrachee, 8 Ralli Bros

Bones—
Ceara, 26 t. R. Singlehurst & Co.
Kurrachee, 5,343 bgs. Ralli Bros
New York, 332 sks.

Caoutchouc—
Cape Coast, 1 cs. J. Smith
,, 6 cks. A Miller, Bros. & Co.
,, 2 A Millerson & Co.
,, 5 W. B. McIver & Co.
,, 1 J. Strutchbury & Co.
,, 1 Ashton, Kinder, & Co.
,, 12
Dixcove, 3 brls. F. & A. Swanzy
,, 2 Radcliffe & Durant
,, 2 pks. Edwards Bros.
,, 2 Pickering & Berthoud
Axim, 2 3 bgs. Edwards Bros
,, 1 brl. G. de Le Perelle
,, 1 F. & A. Swanzy
,, 1 Lintott Bros.
,, 2 Millward, Bradbury & Co.
Sierra Leone, 7 pks. Paterson, Zachonis, & Co.
,, 51
Gr. Bassam, 1 cs. F. Schaeffer
,, 1 A. Millerson & Co.
,, 3 A. Gandle
,, 11 W. D. Woodin
,, 2 Letchford & Co.
,, 2 Rider, Son, & Co.
Accra, 2 cks. L. Hart & Co.
,, 5 Hutton & Co.
,, 27 J. J. Fiscober & Co.
Salt Pond, 3 1 Pickering & Berthoud
,, 2 W. Griffiths & Co.
,, 6 A. Miller, Bros., & Co.
,, 4 Lane & Co.
Cape Coast, 1 Edwards Bros.
,, 2 W. Symington & Co.
,, 9 C. Lane & Co.
,, 1 C. L. Clare & Co.
Sierra Leone, 1
Bathurst, 9 cks. Cie Francaise
,, 17 2 A. Cross & Co.
,, 3 Radcliffe & Durant
,, 9 ,,
Attaboe, 4 5 bgs. ,,
,, 3 Edwards Bros.
,, 7 Pickering & Berthoud
,, 2 W. D. Woodin & Co.
Bargin, 3 ,,
,, 1 Edwards Bros.
,, 4 Pickering & Berthoud
Grand Bassam, 7 cs. Edwards Bros.
,, 3 cks. F. & A. Swanzy
,, 10
,, 1 S. & C. Nordlinger
,, 1 Mordaunt Bros.
,, 1 W. Symington & Co.

Caoutchouc—*continued.*
Cape Coast, 2 9 Fletcher & Fraser
,, 1 8 W. B. McIver & Co.
,, 1 Hutchbury & Co.
,, 2 G. Hutson
,, 1 5 W. Duff & Co.
,, 5 Taylor, Laughland & Co.
,, 4 6 A. Millerson
,, 17 13 Grimwade, Ridley
,, 1 Ihlers & Bell
,, 2 T. E. Tomlinson
,, 2 C. L. Clare & Co.
,, 6 5 ,,
Half Jack, 1 R. W. King
Sierra Leone, 2 Paterson, Zachonis, & Co.
,, 1 Aston, Kender, & Co.
,, 7 Broadhurst, Son, & Co.
Salt Pond, 1 T. E. Tomlinson
,, 2 F. & A. Swanzy
,, 3 W. Symington & Co.
,, 3 C. Lane & Co.
,, 2 W. Frixen
,, 4 Barbour Bros.
,, 1 W. B. McIver & Co.
,, 8 2
Cape Coast, 3 Radcliffe & Durant
,, 1 13 Edwards Bros.
,, 2 3 F. & A. Swanzy
,, 1 N. Nathan & Co.
,, 1 Mordaunt Bros.
,, 41 20 A. Miller, Bros., & Co.
,, 4 Challenor & Co.
,, 1 W. D. Woodin
Ceara, 80 brls. Rosing, Bros., & Co.
,, 60 Leach, Harrison & Co.
Akassa, 134 bgs Royal Niger Co.
Winnebah, 1 cs. C. Lane & Co.
,, 2 1
Accra, 26 F. & A. Swanzy
,, 22 J. P. Werner
,, 34 J. J. Fischer & Co.
,, 1 2 Edwards Bros.
,, 3 Universal Comcl. Bank
,, 12 C. Lane & Co.
,, 16 Hutton & Co.
,, 3 E. H. Perrin
Salt Pond, 6 Edwards Bros.
,, 1 22 Pickering & Berthoud
,, 1 Radcliffe & Durant
Accra, 15 brls. Pickering & Berthoud
Sierra Leone, 17 2 pns. 7 cks. ,,
,, 10
Freetown, 1 N. Waterhouse & Son
Cameroons, 2 cks. D. Jones & Co.
Old Calabar, 5 Pickering & Berthoud
,, 6
Bibundi, 1 cs. 1 L. Hart & Co.
Bageida, 3 4 2 pns. F. & A. Swanzy
Lorne, 2 15 ,,
,, 3 C. Rottmann
Quitta, 10 cks. Rodatz & Co.
Lisbon, 100 20 bdls.
Philadelphia, 14

Copper Ore—
Lisbon, 20 brls. Richardson & Co.
,, 150 t. Harrington & Co.

Carbon—
Philadelphia, 57 brls. Morris & Ashley, Limited

Chrome Ore—
Smyrna, 30 bgs.
Rotterdam, 5 and a quantity. G. G. Blackwell

Cream of Tartar—
Rotterdam, 6 cks.

Chloral Hydrate—
Rotterdam, 2 cs.

Caustic Potash—
Dunkirk, 20 dms.

Chemicals *(otherwise undescribed)*
Hamburg, 4 cs.
,, 4
Rouen, 44 cks. Co-op. W'sale Society, Ltd.

Dyestuffs—
Extracts
Antwerp, 15 bxs. J. T. Fletcher & Co.

Dyestuffs—*continued.*
Extracts
Dunkirk, 10 cs.
New York, 10 brls. 10 bxs.
Logwood
La Guayra, 325 t. Brownbill & Co.
Saffron
Valencia, 3 cs.
Gambier
Singapore, 4,486 brls.
Akassa, 192 bgs. Royal Niger Co.
Singapore, 173
Madders
Smyrna, 12 bls.
Yellow Berries
Smyrna, 98 bgs.
Valonia
Syra, 5 S. Vivante & Son
Smyrna, 2
,, 270 195 t.
Argols
Oporto, 23 cks. F. Leyland & Co.
Cochineal
Teneriffe, 25 bgs. The German Bank, N.Y.
Las Palmas, 10 Kolp & Co
,, 3 G. Betzold & Co.
,, 16 Swanston & Co.
Gr. Canary, 13 Widow, Duranty, & Sons

Dyestuffs *(otherwise undescribed)*
Colon, 75 cs. E. Chasney & Co.

Glycerine—
Hamburg, 1 dm.
Rotterdam, 1 cs.
Rouen, 10 cs. Co-op. W'sale Society, Ld.

Glucose—
Hamburg, 25 cks.
,, 12
Philadelphia, 180 brls.

Graphite—
Hamburg, 34 cks.

Gutta Percha—
Akassa, 513 bgs. Royal Niger Co.

Horn Piths—
Rio Grande do Sul, 10,060 Beckwith & Co.
Ceara, 1 t. A. V. Heyden

Isinglass—
Oporto, 3 cks. Grimston, Sons & Co.

Potash—
Rouen, 59 cks. Co-op. W'sale Society, Ld.
Rotterdam, 19
Dunkirk, 2 17 dms.
,, 4 cks.

Pyrites—
Huelva, 1,641 t. Tennants & Co.
,, 1,420 Matheson & Co.
,, 1,577 Tennants & Co.
,, 1,737 ,,
Huelva, 1,241 ,,

Potash Salts—
Hamburg, 508 bgs.

Pitch—
Rotterdam, 57 cks.

Potassium Bin-Oxalate—
Dunkirk, 10 cks.

Sulphur—
Bordeaux, 1 cs.

Sugar of Lead—
Hamburg, 33 cks.

Stearine—
Antwerp, 55 bgs.

Saltpetre—
Hamburg, 150 sks.
,, 104 cks.

Soap—
Dunkirk, 2 cs.
Rotterdam, 15
Marseilles, 5 Cowden
,, 9 Merchants Bank of Halifax
Philadelphia, 25 crts. 700 bxs.

Sulphur Ore—
Huelva, 1,108 t. Matheson & Co.
,, 1,394 t. ,,

Turpentine—
Savannah, 1,000 cks.

Tartaric Acid—
Rotterdam, 20 kgs.
Marseilles, 8 brls.

Talc—
Marseilles, 100 bgs.

Tartar—
Bordeaux, 4 cks.
,, 1

Ultramarine—
Rotterdam, 10 cs.
,, 6 4 cks.

Verdigris—
Bordeaux, 2 cks.
Waste Salt—
Hamburg, 110 t.
Zinc Ashes—
Marseilles, 74 brls.
Boston, 42
Zinc Oxide—
Antwerp, 40 brls. J. T. Fletcher & Co.
,, 60
Terneuzen, 75 cks. ,,
,, 40 ,,
Hamburg, 40

GLASGOW.

Week ending November 20th.

Alum—
Rotterdam, 16 cks. J. Rankine & Son
Barytes—
Rotterdam, 23 cks J. Rankine & Son
Antwerp, 150 bgs.
Rotterdam, 65 J. Rankine & Son
Chemicals *(otherwise undescribed)*
Hamburg, 1 cs.
Dyestuffs—
Madders
Rotterdam, 6 cks. 1 box J. Rankine & Son
Alizarine
Rotterdam, 91 cks. 6 cs. J. Rankine & Co.
,, 133 J. Rankine & Son
Extracts
Antwerp, 2 cks. 15 cs.
,, 1
,, 4 1
,, 1
Glycerine—
Rotterdam, 1 cs. J. Rankine & Son
Gutta Percha—
Hamburg, 7 bskts.
Sulphur Ore—
Drontheim, 130 t.
Stearine—
Antwerp, 63 bxs.
Tartar—
Oporto, 5 cks.
Waste Salt—
Hamburg, 1,016 bgs. 110 t.
Zinc Oxide—
Antwerp, 35 cks.
Rotterdam, 25 J. Rankine & Son

HULL.

Week ending November 20th.

Acid *(otherwise undescribed)—*
Amsterdam, 26 cks. W. & C. L. Ringrose
Rotterdam, 2 ,, ,,
Hamburg, 2 crbys. Wilson, Sons, & Co.
Barytes—
Antwerp, 19 cks. H. F. Pudsey
Bremen, 20 Blundell, Spence, & Co.
Cream of Tartar—
Rotterdam, 6 cks. Hutchinson & Son
Carbolic Acid—
New York, 7 cks.
Chemicals *(otherwise undescribed)*
Antwerp, 41 pks. Wilson, Sons, & Co.
Dunkirk, 65 ,, ,,
Stettin, 98 ,, ,,
Rotterdam, 1 W. & C. L. Ringrose
Bremen, 1 cs. 2 cks. Veltmann & Co.
Hamburg, 2 Bailey & Leetham
Dyestuffs—
Logwood
Boston, 125 Wilson, Sons &, Co.
Fustic
Boston, 110 bxs. Wilson, Sons & Co.
Madders
Rotterdam, 4 cks. W. & C. L. Ringrose
,, 1 Hutchinson & Son
Alizarine
Rotterdam, 17 cks. Hutchinson & Son
,, 2 W. & C. L. Ringrose
,, 32 Hutchinson & Son
,, 43 3 cs. Hutchinson & Son
,, 20 2 W. & C. L. Ringrose
,, 21 Hutchinson & Son
Sumac
Trieste, 87 bgs. Wilson, Sons, & Co.
Catania, 2,687 ,, ,,
,, 200 ,, ,,
Palermo, 1,000 ,, ,,
,, 450 ,, ,,

Glycerine—
Amsterdam, 16 pks.
Hamburg, 1 drm.
Glucose—
Hamburg, 20 cks. Woodhouse & Co.
Stettin, 800 bgs. C. & M. Lofthouse & Co.
New York, 50 brls.
,, 20
Stettin, 5 cks. Wilson, Sons, & Co.
,, 1,221 bgs. C. M. Lofthouse & Co.
Hamburg, 25 cks. Woodhouse & Co
,, 27 Rawson & Robinson
Rotterdam, 40 bgs. Hutchinson & Son
Ore—
Bordeaux, 13 cks. Rawson & Robinson
Phosphate—
Treport, 180 t. Hammond, Emes, & Co.
Rouen, 25 cs. Wilson, Sons & Co.
Pitch—
Amsterdam, 13 cks. H. F. Pudsey
Antwerp, 12 ,, ,,
Potash—
Rotterdam, 38 cks. G. Lawson & Sons
Saltpetre—
Hamburg, 5 cks. Bailey & Leetham
Tar—
Bordeaux, 5 cks. Rawson & Robinson
Wasa, 261½ brls. 150 brls. J. Good & Sons
Turpentine—
Bordeaux, 79 cks. Rawson & Robinson
Ultramarine—
Rotterdam, 19 cks. Sissons, Bros., & Co.
Zinc Oxide—
Rotterdam, 5 cks. C. M. Lofthouse & Co.

TYNE.

Week ending November 19th.

Alum Earth—
Hamburg, 9 cks. Tyne S. S. Co.
Barytes—
Rotterdam, 12 cks. Tyne S. S. Co.
Glucose—
New York, 20 brls. C. Furness
Phosphate—
Antwerp, 118 t. Langdale's Chemical Manure Co.
Salt—
Hamburg, 1,016 bgs. Tyne S. S. Co.
Zinc Oxide—
Antwerp, 45 brls. Tyne S. S. Co.
Zinc Ore—
Bergen, 1 bg.

GRIMSBY.

Week ending November 15th.

Chemicals *(otherwise undescribed)*
Hamburg, 5 pks.
Kainit—
Hamburg, quantity
Zinc Ashes—
Antwerp, 16 cks.

GOOLE.

Week ending November 12th.

Alkali—
Rotterdam, 3 cks.
Antimony—
Boulogne, 1 ck. 1 cs.
Caoutchouc—
Boulogne, 8 cks.
Dyestuffs—
Madders
Rotterdam, 2 cks.
Alizarine
Rotterdam, 55 cks.
Logwood
Belize, 380 t.
Kingston, 362
Savannah la Mar, 390 t.
Fustic
Corrinto, 550 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 5 cs. 125 cks. 3 pks.
Glucose—
Hamburg, 20 cks.
Potash—
Calais, 20 drms. 16 brls.
Sodium Silicate—
Hamburg, 8 brls.
Saltpetre—
Hamburg, 24 brls.
Rotterdam, 100 bgs.
Waste Salt—
Hamburg, 210 t.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending November 12th.

Arsenic—			
Wellington,	1 t.	16 c.	£28
Otago,		40	32
Wellington,	1		18
Ammonium Carbonate—			
Odessa,	10 kgs.		£16
Dunedin,		5 c.	13
Lisbon,		10	16
New York,	112 pks.		520
Algoa Bay,		5	11
Ammonia—			
Halifax,		10 cs.	£15
Acids *(otherwise undescribed)—*			
Cologne,		230 btls.	£370
Sydney,		3 cs.	13
Brisbane,		3 pks.	13
Ammonium Sulphate—			
Hamburg,	200 t.		£2,270
Ghent,	50	15 c.	605
Berbice,	10		125
Aniline Oil—			
Barcelona,	1 t.	2 c.	£120
Aniline Salts—			
Barcelona,	2 t.	11 c.	£200
Barytes Sulphate—			
Leghorn,	60 cks.		£165
Bones—			
Jersey,	2 t.		£12
Treport,	6		50
Le Treport,	25	12 c.	210
Borax—			
Hamburg,		14 c.	£33
Melbourne,	1 t.		28
Sydney,	2		61
Cologne.	1	4	30
Genoa,		16	64
Baryta Nitrate—			
New York,	1 t.	10 c.	£25
,,		10	10
Bluestone—			
Melbourne,	1 t.	6 c.	£23
Copperas—			
Cologne,		8 c.	£12
Citric Acid—			
Rotterdam,		1 c.	£7
Genoa,		5 c.	36
Reval,	1 t.		150
Stettin,		2	14
Melbourne,	1		135
Cape Town,		2	18
Rotterdam,	1 brl.		15
Colombo,		3	23
Carbolic Acid—			
Brisbane,	22 pks.		£12
Hamburg,		4 c.	8
Boulogne,	14 t.		847
Genoa,		17	37
Antwerp,		24 drs.	407
Paris,	1	2	53
Treport,		10 cks.	18
Cape Town,		3 cs.	28
Cologne,	5	15	284
Calais,	1	9	49
Rouen,		7	17
Cream of Tartar—			
Brisbane,	20 cs		£108
Auckland,		19 c.	100
Nelson,		5	25
Melbourne,	1 t.	10	160
Cossack,		4	22
Copper Sulphate—			
Varna,		12 c.	£12
Wellington,		10	10
Melbourne,	1 t.		19
Adelaide,	5		96
Lyttelton,	1		20
Genoa,	5		90
Reval,	6		114
Caustic Soda—			
Mauritius,	15 t.		£230
Auckland,	5	12 c.	64
Cobalt Oxide—			
Hamburg,		4 c.	£188
Charcoal—			
Hamburg,	20 t.	10 c.	£105
Coal Products—			
Auckland,		98 pks.	£44
Tar			
Sydney,	100 drs.		£26
Natal,	100		22
Danzig,	1,371 brls.		740
Bombay,	100		50
Stettin,	200		92
Calcutta,		2 drs.	100
Dunedin,		12 pks.	12
Port Louis,	35		19
Aniline Oil			
Genoa,	20 drs.		£1,100
Leghorn,	5 rlts.		60
Genoa,	10		120
Wellington,	1 cs.		10
Benzole			
Rotterdam,		48 drs.	£785
Terneuzen,		8	199
Rotterdam,		96	1,688
,,	20 cks.		386
Calais,	20		425
Anthracene			
Rotterdam,		38 cks.	£160
Cologne,		252	1,598
Naphthaline			
Hamburg,	10 t.		£68
,,	15		45
Rotterdam,	25		70
Brussels,		10 c.	27
Hamburg,	1		52
Le Treport,	1		13
Naphtha			
Melbourne,		10 drs.	£10
Pitch			
Antwerp,	160 t.		£240
Rio de Janeiro,		20 brls.	17
Boston,		1,500	623
Danzig,	200		380
Antwerp,	535		887
Genoa,	1,276		2,233
Venice,	620		1,054
Cadiz,	215		323
Naples,		200 cks.	80
La Rochelle,	200		290
Alexandria,	25		60
La Rochelle,	416		672
Duisburg,	150		25
Amsterdam,		19 c.	16
Brest,	100		150
Creosote Salts			
Stettin,		131 cks.	£150

Chemicals *(otherwise undescribed)*
Townsville, 33 t. 7 c. £55
New York, 2 cks. 16
Cape Town, 18 70
Colombo, 1 cs. 15
Melbourne, 3 pks 12
Valencia, 3 cs. 22
Auckland, 6 pks. 17
Sydney, 39 kgs. 187
Melbourne, 5 cs. 1 tk. 110

Disinfectants—
Sydney, 13 cs. £59
Brisbane, 5 pks. 18

Glycerine—
Hamburg, 15 t. 18 c. 360
Lisbon, 2 20
New York, 10 79
New Orleans, 5 50
New York, 10 cs. 20
Melbourne, 10 29

Guano—
Jersey, 95 t. £950
Cherbourg, 81 10 c. 815
Berbice, 20 236

Insect Powder—
E. London, 1 cs. £13
Algoa, 1 16
" 3 c. 27
Natal, 3 28
E. London, 1 15

Magnesia—
Wellington, 5 cs. £10

Manure—
Jersey, 20 t. £150
Trinidad, 2 52
Cape Town, 121 850
Barbadoes, 25 212
St Lucia, 15 130
Morant Bay, 6 10 c. 56
" 12 10 116
Demerara, 100 1,050
Hamburg, 165 2,145
Mangalore, 2 t. 18
St. Lucia, 15 120
E. London, 45 570
Genoa, 97 10 342
Jersey, 84 418
Guernsey, 150 10
Berbice, 10 110
Falmouth, 5 52

Oxalic Acid—
Rotterdam, 6 c. £10

Phosphorus—
Dunedin, 10 c. £76
Wellington, 5 42

Potash—
Sydney, 5 c. £23

Potassium Chlorate—
Oporto, 2 t. £95
Gothenburg, 10 kgs. 2
New York, 5 t. 8 c. 24 8/3
Hong Kong, 1 10 7 3

Potassium Permanganate—
Montreal, 10 cs. £2 3

Potassium Cyanide—
New York, 23 c. £154

Phosphate—
Treport, 20 t. £150

Superphosphate—
Dunedin, 30 t. 120

Sodium Tartrate—
Montreal, 6 c. £21

Sheep Dip—
Usefull Hill, 60 cs. 10 pks. £196
Pimta Delgasa, 125 brls. 656
E. London, 15 c. 42
Oamaru, 250 drs. 235
Algoa Bay, 30 cs. 80
Nelson, 50 drs. 29
E. London, 2 t. 10 c. 135
Port Chalmers, 20 cks. 200 drs. 303
Gisborne, 100 59
Wellington, 20 cks. 300 362
Algoa Bay, 25 cs. 70
Lyttelton, 200 450
Durban, 15 pks. 18

Superphosphate of Lime—
Jersey, 60 t. £300

Saltpetre—
St. John, N B., 10 c. £11
Wellington, 10 11
Brisbane, 10 11
Valencia, 16 16
Oporto, 5 t. 10 113
Melbourne, 1 10 33
Boston, 7 14 169

Sulphuric Acid—
Natal, 10 t. 10 c. £51
Algoa Bay, 50 cs. 36

Soda Salts—
New York. 2 t. 11 c. £25
" 2 13 26

Sulphur—
Trinidad, 1 t. 20
Algoa Bay, 100 kgs. 54
Calcutta, 32 brls. 31
E. London, 7 t. 15 c. 79
New York, 9 9

Strontium Nitrate—
New York, 3 t. 10 c. £99

Tartaric Acid—
Wellington, 3 c. £21
Brisbane, 5 cs. 36
" 10 kgs. 60
Lisbon, 3 20
Nelson, 3 19
Melbourne, 1 t. 10 195
B. Ayres, 1 11 198

LIVERPOOL.

Week ending Nov. 15th.

Alkali—
Calcutta, 30 cs.
Rotterdam, 14 cks.

Ammonia—
Vera Cruz, 1 c. 3 q. £9

Ammonium Nitrate—
Naples, 1 c. £6

Ammonium Carbonate—
Genoa, 1 t. 2 c. 3 q. £32
Sydney, 2 10 2 55

Ammonium Muriate—
Havre, 1 t. £23
San Francisco, 1 1 c. 20
New York, 6 10 140

Alum—
Alexandria, 1 t. 10 c. £8
Montreal, 5 6 14
Beyrout, 2 17 15
Patras, 1 8 7
Piræus, 7 9 35
Salaora, 19 5
Cape Town, 2 1 10
Valencia, 2 2 10
Volo, 4 1 21
Havana, 6 11 33
Rio de Janeiro, 19 5
Malta, 3 1 14
Calcutta, 30 19 148
Callao, 4 9 24
Volo, 4 1 3 q. 23
Oran, 3 18
Sydney, 2 2 13

Antimony Regulus—
Montreal, 2 t. 1 q. £148

Alum Cake—
Calcutta, 9 t. £35

Ammonium Sulphate—
Bordeaux, 20 t. 7 c. 3 q. £240
Malaga, 101 3 2 1,215
Valencia, 10 3 3 120
Bordeaux, 10 2 126
Malaga, 2 2 23
Valencia, 10 4 1 108

Bleaching Powder—
Antwerp, 30 cks.
Boston. 417 46 tcs.
New York, 229
Rouen, 122
Baltimore, 317
Boston, 90
B. Ayres, 27
Genoa, 39
New York, 174
Windsor Mills, 46

Borax—
Antwerp, 1 t. 3 c. £32
Cardenas, 5 1 q. 9
Odessa, 1 1 3 30
Valparaiso, 4 7
Malaga, 8 12
Lisbon, 15 2 22
Antwerp, 1 9 3 41
Rotterdam, 11 3 313
Ibrail, 17 3 27
19 28
B. Ayres, 2 19 73
Barcelona, 3 14 103
Rotterdam, 5 10 159

Bone Ash—
Taltal, 11 c. 3 q. £19

Borate of Lime—
Trieste, 49 t. 15 c. £547

Cobalt Oxide—
New York, 4 c. 3 q. £203

Caustic Soda—
Adelaide, 35 dms.
Algoa Bay, 3
Antwerp, 11

Caustic Soda—*continued.*
Beyrout, 20 dms.
Boston, 431
Ceara, 20
Galatz, 238
Havana, 40
Ibrail, 595
Leghorn, 60
Lisbon. 35
Malaga, 26
Melbourne, 68
Messina, 40
Monte Video. 50
Naples, 30
New Orleans, 200
Pasages, 10
Rotterdam, 10
Savanilla, 20 kgs.
Seville, 62
Algoa Bay, 42 bxs.
Amsterdam, 5 12
Barcelona, 200
Bari, 17
Cardenas, 14
Galatz, 15
Genoa, 130
Ghent, 3
Havre, 15
Ibrail, 15
La Guayra, 20
Madeira, 10
Malaga, 42
New York, 430
Oporto, 65
Pernambuco, 10
Piræus, 30
Portland, 19 cks. 339
Riga, 210
Rotterdam, 25
Samarang, 7
San Francisco, 200
Sourabaya, 4
Sydney, 60
Trieste, 10
Valencia, 10
Valparaiso, 60
Yokohama, 2

Copper Sulphate—
Corunna, 8 c. 2 q. £8
Odessa. 1 t. 17 3 32
Rotterdam, 2 12 47
Rouen, 17 7 304
Tarragona, 6 3 1 111
Venice, 10 180
Barcelona, 25 4 2 478
Genoa, 2 1 3 42
Bordeaux, 49 10 980
Hamburg, 5 2 3 94
Adelaide, 17 10 339
Calcutta, 40 723
Antwerp, 4 18 2 86
Catania, 10 2 176
Oporto, 5 1 1 88
Bordeaux, 30 6 581
Dunkirk, 3 53
Genoa, 155 5 1 2,726
Venice, 11 2 2 192
Leghorn, 4 17 1 84
Sydney, 5 81
Vera Cruz, 10 177
Barcelona, 64 19 2 689
Genoa, 5 9 103
" 5 2 2 90
Bilbao, 15 3 260
Bordeaux, 10 193
Brindisi, 30 555
Santander, 10 2 190
Piræus, 13 1 13
Antwerp, 2 1 40
Salonica, 1 5 25
Trieste, 8 2 8
Catania, 10 3 360
Genoa, 33 2 605
Halifax, 5 1 3 100
Venice, 44 12 807
Bordeaux, 44 19 2 805
Sydney, 3 58
Ibrail, 1 5 23

Carbolic Acid—
Montreal, 4 c. £98
Bombay, 1 t. 10 21
Rotterdam, 5 15
New York, 4 4 219
Hamburg, 7 17 2 q. 597

Copperas—
Beyrout, 3 t. 6 c. £8
Alexandria, 2 13 6
Beyrout, 5 5 3 q. 13
Alexandria, 6 16 15
Patras, 3 1 2 7
Rotterdam, 5 8 36
San Francisco, 12 18 28

Caustic Potash—
Antwerp, 1 t. 1 c. £22
Melbourne 8 18 186
Sydney, 2 2 47

Cream of Tartar—
Portland, 1 t. 1 c. 1 q. £99

Disinfectants—
Calcutta, 8 cs. £5
Montreal, 1 c. 9

Dried Blood—
Marseilles, 50 t. 10 c. £253

Epsom Salts—
Rio de Janeiro, 50 kgs.

Guano—
Tarragona, 19 t. 18 c. 2 q. £196
Valencia, 19 18 317
Malaga, 19 18 2 179

Manure—
Genoa, 29 t. 11 c. £104
Gr. Canary, 5 1 q. 24

Magnesium Chloride—
Rouen, 10 t. 8 c. £30

Mono-Chlor Acetic Acid—
Hamburg, 2 c. 2 q. £14

Oxalic Acid—
Barcelona, 6 t. 15 c. £200
New York, 10 6 c. 325

Pitch—
New York, 36 bgs. 31 cks.
Sydney, 5 brls.

Potashes—
Campana, 4 c. £5

Phosphate—
Valencia, 13 t. 18 c. £64

Potassium Bichromate—
Venice, 7 t. 1 c. 2 q. £210
Santos, 1 4 3 95

Potassium Chlorate—
Gothenburg, 4 t. £187
Calcutta, 13 c. 33
Philadelphia, 5 210
Corunna, 10 25
Genoa, 1 10 74
San Juano, 1 3 1 q. 70
Gothenburg, 9 9 453
Genoa, 2 10 99
New York, 5 246
B. Ayres, 13 31
Stockholm, 4 187
Bari, 1 5 58
Genoa, 10 24
Hamburg, 1 49
" 1 10 74

Phosphorus—
Kingston, 1 c. £5
San Juan, 3 2 q. 50
Mexico City, 13 83

Potassium Carbonate—
Antwerp, 5 c. £5

Soap—
Accra, 100 bxs.
Algoa Bay, 50
Amsterdam, 2,000
Antwerp, 400 cs.
Appolonia, 60
Benin, 200
Bluefields, 125
Calcutta, 250 pks.
" 56
Demerara, 1,200
E. London, 1,600
Gibraltar, 480
Grand Bassa, 80
Grand Canary, 520
Hong Kong, 100
Kingston, 2 715 2
Loanda, 70
Macassar, 2,000
Malta, 30
Mauritius, 555
Mussera, 95
Old Calabar, 800
Opobo, 2,500
Para, 1
Port Natal, 210
Rangoon, 500
St. Johns, 160
St. Lucia, 850
Shanghai, 2,500
Sierra Leone, 30
Swrinham, 90
Teneriffe, 224
Trinidad, 790
Antwerp, 200
Belize, 700
Bombay, 6 16 dms.
Cape Coast, 1
Falmouth, 20
Gibraltar, 110
Kingston, 285
Las Palmas, 490
Malta, 41
Nassau, 72
New York, 4 cks.
Piræus, 25 bdls.
St. Thomas, 250
Teneriffe, 75

Soda Ash—
Adelaide, 50 brls.
Baltimore, 135 cks.
Barcelona, 85
Boston, 130 tcs. 640 bgs.
B. Ayres, 150
Lisbon, 42
NewYork, 290
Philadelphia, 247 79 cks.
Seville, 6
Smyrna, 50
Baltimore, 402 305
Beyrout, 30
Boston, 2,050 bgs. 165
Mahe, 20
Malta, 12
New York, 379 tcs. 283
Oporto, 16
Philadelphia, 68
Puerto Cabello, 32
Rio de Janeiro, 150
San Francisco, 259 tcs.
Valparaiso, 60
Yokohama, 443

Salt—
Antwerp, 160 t.
Bilbao, 2½
Black Point, 25
B. Ayres, 22
Galveston, 775
Ghent, 110
Iquique, 5 cs.
Jersey, 20
Landana, 8
Loango, 62
Manaos, 36
New Orleans, 200
New York, 50
Puerto Cortez, 25
Salt Pond, 10
Savannah, 500
Sierra Leone, 100
Antwerp, 30
Auckland, 10
Calcutta, 4,357
Cape Coast, 12
Dunedin, 50
Opobo, 100
Para, 70 14 c.
Philadelphia, 50
Savannah, 500
Sierra Leone, 100
Sydney, 200
Victoria, B.C., 150
Kingston, 12

Soda Crystals—
Boston, 280 brls.
New York, 60 cks.
Alexandria, 63
Boston, 280
Constantinople, 50
Halifax, 25
Quebec, 25
Sydney, 67

Sodium Carbonate—
Trinidad, 20 kgs.
New York, 84 brls.
Vear Cruz, 5 c. 2 q. £6

Sodium Silicate—
Constantinople, 10 brls.
Corfu, 10
Havre, 4
Salonica, 17
Messina, 21

Sodium Bicarbonate—
Alexandria, 20 brls.
B. Ayres, 50 20 kgs.
Halifax, 135
Lisbon, 40
New York, 200
Yokohama, 1,000

Sodium Nitrate—
Barcelona, 6 t. 4 c. 1 q. £53

Sodium Manganate—
New York, 12 c. £9

Salt Cake—
Baltimore, 67 t. 13 c. £152
,, 46 13 110

alammoniac—
Hamburg, 1 t. £35
Malta, 8 c. 14
Naples, 10 2 q. 17
Ibrail, 16 3 26
Leghorn, 4 2 7
Genoa, 9 14
Marseilles, 14 3 24
Genoa, 9 2 15
Rouen, 1 9 50
Campana, 3 5
Smyrna, 1 2 1 36

Sodium Bichromate—
Havre, 5 t. £130

Sheep Dip—
Algoa Bay, 3 t. £100
Natal, 1 40
Algoa Bay, 8 c. 2 q. 17
B. Ayres, 4 1 3 84
San Francisco, 7 17 2 298
Monte Video, 11 drs. 13
Galveston, 11 400

Sodium Phosphate—
Piræus, 5 c. 1 q. £5

Sulphur—
Montreal, 20 t. 17 c. £93
Rouen, 10 1 43
Carthagena, 10 1 q. 5
Portland, N. 6 10 31

Sodium Biborate—
Rotterdam, 9 3 q £15
New York, 10 23
Antwerp, 2 10 c. 3 q. 95
Hamburg, 10 1 2 602

Sodium Sulphate—
Hamburg, 2 t. 1 q. £10

Sodium Chlorate—
Hamburg, 1 t. £55

Saltpetre—
Ibrail, 1 t. 5 c. £29

Strontia—
Rotterdam, 9 t. 3 c. £111

Tin Phosphate—
Bangkok, 1 c. £7

Tartars—
Santo, 9 c. £25

Zinc Chloride—
Bombay, 1 t. 1 c. £18

TYNE.

Week ending November 19th.

Antimony—
Rotterdam, 2 t. 10 c.

Alkali—
Abo, 5 t. 10 c.
Amsterdam, 14 12
Reval, 27 14
Rotterdam, 1 13
Copenhagen, 2 9
Riga, 35 16

Ammonium Sulphate—
Rotterdam, 45 t.

Blanc Fixe—
New York, 1 c.
Dunkirk, 10 t.

Bleaching Powder—
Helsingfors, 100 t. 2 c.
,, 40 3
Rotterdam, 39 15
Amsterdam, 39 8
New York, 25 1
Hamburg, 10 17
Antwerp, 19 4
Dunkirk, 10 3
,, 5 2
,, 19 19
Newfairwater, 13 12
Stettin. 87 2
Rotterdam, 2 16
Ghent, 11

Barytes Carbonate—
New York, 50 t.
Stettin, 101
,, 9 10 c.

Barytes—
Rotterdam, 1 t. 9 c.

Caustic Soda—
New York, 109 t. 19 c.
Gothenburg, 27 15
,, 11 8
,, 2 16
Hamburg, 27 15
Antwerp, 2 12
Newfairwater, 14 5
Libau, 35
Riga, 24 19

Copperas—
Abo, 20 t. 19 c.

Litharge—
Reval, 1 t. 10 c.
Hamburg, 12

Magnesia—
Hamburg, 14 c.

Potassium Chlorate—
Helsingfors, 1 t. 5 c.
Hamburg, 5
Malmo, 1 12

Potassium Bichromate—
Helsingfors, 1 t. 2 c.

Pitch—
Helsingfors, 40 t. 4 c.
Stettin, 35

Soda Ash—
Gothenburg, 9 t. 15 c.
Newfairwater, 100 11

Soda—
Aarhuus, 16 t. 3 c.
Rotterdam, 9 5
Esbjerg, 5 5
Copenhagen, 21 9
Odense, 32 11
Helsingfors, 1 6
,, 7 15
Rotterdam, 2 13
Amsterdam, 5 18
Gothenburg, 58 8
New York, 107 17
Randers, 22 11
Gothenburg, 20
,, 5 1

Sulphur—
Christiania, 60 t.
,, 10
Stettin, 25
Rotterdam, 15
Riga, 1 10 c.
Helsingfors, 50
Antwerp, 4
Helsingfors, 50
Gothenburg, 50

Sodium Hyposulphite—
N. Orleans, 20 t.
,, 7 12 c.
San Francisco, 10
Helsingfors, 1 2

Sodium Sulphate—
Gothenburg, 139 t. 8 c.
Helsingfors, 1 6
Gothenburg, 25 9

Tar—
Christiansand, 1 t. 9 c.
Danzig, 70 7
Helsingfors, 40

GLASGOW.

Week ending November 20th.

Ammonium Sulphate—
Demerara, 217 t. 13½ £3,568
,, 126 10½ 1,408

Ammonium Muriate—
Italy, 2 t. 4½ c. £50

Benzole—
Rotterdam, 10 drms. £88

Borax—
Rotterdam, 1 ck. £12

Caustic Soda—
New York, 209 c. £98

Dyestuffs—
Logwood
Rotterdam, 11 t. 15 c. £83

Manganese—
Italy, 49 c. £25

Manganese Oxide—
New York, 199¾ c. £55

Paraffin Wax—
Italy, 480 c. £889
Livonia, 4 t. 8½ c. £90
Japan, 61¼ c. £719

Potassium Prussiate—
New York, £1,875

Potassium Bichromate—
Antwerp, 204¾ c. £315
Stockholm, 1 cs. 14
Italy, 338 c. £632
,, 223¾ 296
Rotterdam, 23 cks. £299

Pitch—
Amsterdam, 200 t. £200
Shanghai, 4 6¼ c. £22
Amsterdam, 334 334

Soap—
Demerara, 50 c. £25

Sulphur—
Demerara, 7 t. 2¾ c. £41. 16s

Sodium Bichromate—
Italy, 524½ c. 626

Sodium Nitrate—
Demerara, 28 t. ¼ c. £191

Turpentine—
Shanghai, 200 gals. £30

Tar—
Rangoon, 530 c. £105. 10s

HULL.

Week ending Nov. 18th.

Alkali—
Libau, 90 kgs.
Trieste, 39 cks.
Venice, 16

Bone Size—
Harbidger, 13 cks.

Bleaching Powder—
Amsterdam, 10 cks.
Drontheim, 32
Danzig, 21
Rotterdam, 14

Caustic Soda—
Antwerp, 33 drms.
Abo, 10
Drontheim, 17 cks.
Konigsberg, 15
Libau, 72
Riga, 803 34
Wyburg, 9

Chemicals *(otherwise undescribed)*
Antwerp, 24 cs. 10 cks.
Amsterdam, 8 pks.
Abo, 5
Bombay, 1,098 100
Bremen, 2 70 2
Christiania, 303 slbs.
Copenhagan, 4 3
Danzig, 84 199
Dunkirk, 45
Gothenburg, 12 cs. 72 12
Helsingfors, 8
Hamburg, 313 47 150
Kurrachee, 100
Konigsberg, 1 42 40
Libau, 74 90
Rotterdam, 15 53 514
Riga, 1 720
Reval, 1 2
Stettin, 3 17
Trieste, 3

Dyestuffs *(otherwise undescribed)*
Amsterdam, 4 pks.
Bombay, 72 cks.
Boston, 6
Gothenburg, 8 1 cs. 38 bgs.
Rotterdam, 3 15
Stettin, 516 b s.

Horn Piths—
Antwerp, 10 bgs.

Manure—
Dunkirk, 5 t.
Hamburg, 2,409 bgs.
Rotterdam, 622
Venice, 10

Pitch—
Antwerp, 158 t.
New York, 253

Tar—
Amsterdam, 14 cs. 2 cks.
Abo, 236
Bombay, 100
Helsingfors, 185
Hamburg, 18
Harlingen, 2

GOOLE.

Week ending November 12th.

Bleaching Powder—
Hamburg, 57 cks.

Benzole—
Rotterdam, 158 cks.

Coal Products—
Antwerp, 45 cks.
Hamburg, 1 cs.
Rotterdam, 264 cks.

Chemicals *(otherwise undescribed)*
Hamburg, 1 cs. 125 cks.

Dyestuffs *(otherwise undescribed)*
Boulogne, 1 cs. 9 cks. 6 drms.
Hamburg, 46
Rotterdam, 5

Manure—
Antwerp, 200 bgs.
Bruges, 184
Boulogne, 233

Pitch—
Antwerp, 80

GRIMSBY.

Week ending November 15th.

Coal Products—
Dieppe, 86 cks.

Chemicals *(otherwise undescribed)*
Antwerp, 2 cks.
Hamburg, 7 cs.
Rotterdam, 10

PRICES CURRENT.

WEDNESDAY, NOVEMBER 26, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅜
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. .. ,,	1	15	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. per ton	10	12	6
,, ,, (grey), Hull .. .. ,,	10	10	0
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	5	0
,, Carbonate (native) .. .. ,,	3	10	0
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	6	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	4	8
,, 50/90 ,, ... ,,	0	3	7
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	5¾
,, (crude 60°) .. .. per gallon	0	1	5
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	9
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	15	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	11
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	56	0	0
,, Sulphate .. .. ,,	18	15	0
,, Oxide (copper scales) .. .. ,,	52	10	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	12	6
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	15	0	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	17	6
,, ,, (grey) .. .. per ton	13	0	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	0
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	10½
Oils:—			
Cotton-seed .. .. per ton	19	10	0
Linseed .. .. ,,	23	5	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅜
,, American .. .. ,,	0	0	5¾
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. per cwt.	£3 5 0 to 3 10 0		
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	0
,, Nitrate .. .. ,,	0	2	10
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	2	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	10	0
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, ...	12	12	6
,, ,, (70 % Caustic Soda) ,, ...	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o b.) ,,	10	0	0
,, Bicarbonate .. .. ,,	7	15	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9	0	0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	0
,, Nitrite, 98 % .. .. per ton	28	10	0
,, Phosphate .. .. ,,	15	15	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	5	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¾
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	10	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	27	10	0
Tin (English Ingots) .. .. ,,	95	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	24	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

THE

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LATE ADVERTISEMENT.

TENDER.

THE Gas Committee of the Leeds Corporation invite TENDERS for the purchase of about 70 tons of SPENT OXIDE. Samples may be obtained on application to Mr. Lupton, Gas Department, Municipal Offices, Leeds, and price per unit of Sulphur per ton to be quoted. Address to the Chairman of the Gas Committee, at the above address, not later than Wednesday, the 17th December.

TO ADVERTISERS.

SPECIAL NEW YEAR'S NUMBER OF THE "CHEMICAL TRADE JOURNAL."

In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers.

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

On the occasion of the New Year's Special Number, we shall make use of the whole of the lists we have referred to, numbering altogether, as we have stated not less than 10,000 names.

Of course, for this special issue. there will be special prices for advertisements, but those who order a series, either commencing with that number or previously, will have the advantage of our regular tariff rates, of bringing their specialities under the notice of a very large circle of buyers.

As only a limited number of pages will be added for advertisements, early application for space is necessary. We shall be pleased to send tariff of charges to all those who may desire to advertise in this Special Number.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates:—

30 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

THE WORKS' CHEMIST.

BY Works' Chemist we specifically mean the person employed in alkali works and chemical works generally to conduct analyses of more or less intricacy, or to make assays and sometimes, also, to make himself generally useful. We believe that an employer ought to use at least as much wisdom and consideration in the selection of his chemist as he would in the selection of his cook, but judging from the wail of discontent which reaches us from various works' chemists, we have a strong suspicion that this is far from being the case. "No man," said Louis XIV., "is a hero to his valet," and perhaps cooks may be found who would give their masters a very much qualified meed of praise. But it is pretty generally accepted that a man does not choose his cook for his ability in one detail, say, frying a sole, but rather goes in for a good all round *chef*, and generally pays him liberally. Is this so with the works' chemist? We take the chemists' complaint as some evidence that it is not. In some cases when a vacancy occurs, and the competitors for it present themselves, a fairly good man comes forward, states his qualifications, and asks a fair salary; then he meets the frost, the employer oftener than not uses some such argument as this, "Oh, we do not want a good all round man, we only want a man who can do so and so, in fact we can get a boy to do all we want." Alas for the poor chemist, who, after taking the trouble and going to the expense of a good training, has to lower his figure to compete with a boy! and alas for the manufacturer who, let us add, hides his head, ostrich like, in the sands of a belief that he can expect to hold his own against the inevitable competition of others who are keen witted enough to see the advantage of a good chemist at a good salary! or of those again who, being trained chemists, join others and become competing employers themselves. This is a complaint which often reaches us. One chemist goes so far as to ask whether some of the employers, who are actively supporting the cry for technical education, are doing so in the hope that it will produce a shoal of boys whose competition will still further reduce salaries? We can offer him the consoling thought that the same argument would apply to other callings, and that when these boys become a multitude of half paid men, they will be sure to find a remedy.

Other chemists complain of the competition of poor relations and younger sons, who are not even hinted at in the negotiations for the position, but who, when the chemist has established himself and is severed from his former connections, are introduced into the laboratory to "pick his brains." As a rule he dare not object, although it frequently results in his being superseded by the relative, whose knowledge is confined to the little chemistry he picked up *at school*! We know from our own observations that works' chemists are more wretchedly remunerated than men in analogous positions in, say, the engineering trades, and we know that it is a very common thing for the chemist to receive, even when he is managing also, less by many pounds per annum than the foreman or the cashier.

In these respects the Works' Chemist has our sympathy, and we hope that the dawning of a brighter day is not far off, when, owing to combined action, or to the protecting wing of an organization which already exists and should be doing something in his behalf, or better still, to the awakening of employers to a truer insight into the elements of commercial success, he will no longer have reason to complain.

The true Works' Chemists are, as a body, not ignorant men, but men of culture. They are, therefore, not likely to raise unreasoning or unreasonable demands backed by a threat to strike. Like all considerable aggregates of men, they will have in their ranks those who have their faults. We have seen men who should be working for their employers who were too fond of putting their hands in their pockets, gossiping, and reading the newspaper. To these we would say that the principle of a "fair day's work for a fair day's wage" is a fundamental one, and that when an employer is paying them for the discharge of certain functions it is their manifest duty to be able, efficient, energetic, and assiduous in their attention to duty and to the interests of their master. Only in this case can they expect that consideration which will bring any substantial improvement in their position.

SOCIETY OF PUBLIC ANALYSTS.

THE QUESTION OF THE USE OF FOOD PRESERVATIVES.

THE first meeting of the session was held on Wednesday, November 12th, the president, Dr. Adams, in the chair. Papers were read by Mr. Hehner and Mr. C. E. Cassal, dealing with the question of "Food Preservatives." The papers being of similar tenour were read consecutively, and the discussion that followed was held upon them jointly. In the view of the authors, and according to the concensus of opinion of those speaking on the subject, the use of food preservatives is to be condemned, even if no direct injury to health can be traced thereto. Substances like boric and salicylic acids cannot be introduced in unknown but repeated doses into the human organism without serious risk of deranging vital processes, at least in such persons as are especially sensitive to the action of the drugs in question. No one, moreover, can be expected to tolerate irresponsible doctoring at the hands of his milkman or brewer, or to be reassured by their assertions of excellence of intention, or careful choice of innocuous preservatives. Granting this, the practical point arises as to the best means for suppressing the practice. It is not quite certain whether it can be dealt with under the Food and Drugs Act, on the ground that the article containing the preservative is not of the "nature, substance, and quality demanded." Stipendiaries and members of the body known as the "Great Unpaid" are fatally apt to judge the heinousness of a proved adulteration by the percentage of adulterant, and might safely be expected to need more than usually laborious explanation before they could realize that a very trifling quantity of a preservative possessing very possibly a notable degree of toxicity might condemn an article of food as effectually as a gross adulteration with inert material. However, failing any special legislation on the subject, which may be reasonably deprecated, there seem grounds for the belief that an authoritative decision may be obtained from one of the higher Courts confirming the view that the practice of adding preservatives to food is an offence against the Food and Drugs Act, and may be dealt with accordingly.

THE DETECTION OF METHYLATED SPIRITS.

The third paper before the meeting was by Dr. Ashby, and described a method he had found useful for detecting methylated spirit in alcoholic tinctures and similar preparations which should be made with pure rectified spirit. It is based upon the fact that the acetone always present in methylated spirit gives a red colouration when treated with a one per cent. solution of sodium nitroprusside, followed by a few drops of ammonia. The reaction takes a few minutes for completion, but is extremely delicate. It is not given by pure methyl alcohol from oil of winter green, but is given by the methyl alcohol obtained by purifying the commercial variety by means of calcium chloride. The delicacy and persistency of the reaction allow of its use for the detection of the traces of impurity that cling to ether prepared from methylated spirit, even after careful purification. Chloroform from the same source, however, gives no indication of its origin. As an analytical method, its simplicity and certainty are strong recommendations.

The meeting then adjourned to December 10th.

THE NEW FRENCH CUSTOMS TARIFF.

THE following are the principal proposed changes. Where such words as "not otherwise described," "other sorts," and so on occur, they refer to the full tariff. In many cases the proposed minimum tariff is the same as the present Conventional one, but the proposed general tariff, to which goods will be subject if no Convention is made, is higher. In such cases we have not, generally, noticed a proposed change, but in cases of some important articles (as some of our heavy chemical exports) have done so.

NOTE OF PRINCIPAL PROPOSED ALTERATIONS CONTINUED.

Figures in first column are lowest duties in force as per tariff of 1882, according to "most favoured nation" clause, which applies to England and to the principal European countries. *Ex.*; Exempt from duty.—N.B.—All rates reduced to shillings per ton unless otherwise stated.

MINERAL SUBSTANCES.

Marble, modern statuary	Ex	120s and 180s
Marble, some other, sculptured	12s	48s and 24s
Alabaster, some	12s	24s and 20s
Alabaster statuary	Ex	120s and 80s
Stone, modern statuary	Ex	120s and 80s
Stone, "chiques"	32s	120s and 80s
Slate for roofing	2f per 1,000	112s and 96s
Bricks, squares, slabs	Ex	32s and 24s
Bricks, squares, enamelled and varnished	Ex	64s and 48s
Worked stone, such as litho, with designs, etc	Ex	120s and 80s
Some other sculptured stones	4s	32s and 24s
Sulphur, sublimated	Ex	20s and 16s
Cement	Ex	6s 5d and 4s
Petroleum, crude	144s	To be provided for according to recommendation of commission of experts.
" refined	200s	

METALS.

Aluminium	4000s	960s and 800s
(One of the few reductions.)		
Machine iron, for making iron wire	48s	60s and 52s
Iron wire, not more than ½ m.m. in dia	80s	96s and 88s
over 1½ m.m. in dia	48s	64s and 56s
Iron wire, other	48s	80s and 72s
Steel ingots	72s	48s and 40s
Steel, bloom and billets and other	72s.	56s and 48s
Steel, axles and tires	48s	80s and 64s
Steel, wire, strings for instruments	160s	320s and 240s
Steel, scrap	24s	12s
(Reductions on rough steel, but advances on manufactured.)		
Lead, alloyed with antimony in lump	24s	40s
Cobalt, lump	Ex	800s and 600s
" powder	Ex	1,080s and 840s

(Copper would be increased 24s per ton, and iron sheets and plates 3s 2d to 8s per ton, in default of convention.)

CHEMICALS.

Iodide of potassium	2800s	4,000s and 3,200s
Gallic acid and other vegetable tanning	9s 7d	Ex
Oleic Acid	Ex	40s and 20s
Oxalic acid	80s	48s and 40s
Stearic acid	64s	176s and 136s
Oxide of iron	Ex	24s and 16s
Kelp	152s	152s and 144s
Caustic soda, in default of convention, would be raised 12s per ton; crude soda and crystal soda, 3s 2d per ton; refined soda, 7s 2d per ton, and 90s per ton (if less than 60 deg); bicarbonate, 6s 5d; other salts of soda, 5s 2d.		
Salt, sea and rock (not white)	Various	19s 2d
Salt, sea and rock, white	Various	26s 5d
Salt.—This is a small reduction in imports into Channel and ocean ports by sea; otherwise an advance.		
Salts of cobalt	Ex	3600s and 2800s
Sulphate of ammonia, crude	62s	Ex

Ammonia alum, potash alum, and sulphate of alumina	7s 2d	40s and 28s
Borax, crude	70s	50s and 40s
Borax, refined	80s	80s and 64s
Carbonate of magnesia	Ex	24s and 16s
Carbonate of lead	Ex	80s and 60s
Chromate of potash	80s	24s and 16s
Lactate of iron	344s	460s and 320s.
Sulphate of quinine	960s per 100 kilogs	1600 and 1200 per 100 kilogs
Sulphate of soda	17s 7d	36s 10d and 28s 10d
Hyposulphite of soda	38s	36s 10d and 28s 10d
Secondary products of the distillation of coal	5 per cent. on value	160s and 120s
Chemical products not otherwise mentioned with alcoholic base	5 per cent. on value	Duty to be fixed by Committee of Exports
Extracts of dyewoods, black or violet	80s	160s and 120s
Extracts of dyewoods, red or yellow	120s	240s and 160s

DYESTUFFS FROM COAL TAR.

Dry	800s	520s and 400s some 1,040s and 800s
Paste	448s	280s and 560s, some 200s and 400s
Artificial alizarine	5 p.c on val.	Ex

COLOURS etc.

Ultramarine	120s	200s and 160s
Prussian blue	100s	240s and 200s
Stone pencils	8s	Ex
Ochre, crushed	Ex	2s 10s and 1s 8d
Earths, Italian	Ex	48s and 40s
,, Cologne, etc	4s	48s and 43s
Green, Schweinfurth, Brunswick, and others	Ex	48s and 40s
Talc, pulverised	Ex	2s 10s and 1s 8d
Oil colours	32s	48s and 64s

VARIOUS COMPOUNDS.

Perfumery, soap	64s	208s and 160s
,, alcoholic	as spirits	800s and 640s
,, non-alcoholic	144s	208s and 160s
Soap, not perfumed	48s	126s and 91s
Lichen sizing	48s	126s and 91s
Medicines, compound, in any official pharmacopia	10 p.c. value	20 and 15 p. c. value
Chicory, roast or ground	32s	80s and 64s
Starch and fecula	32s	104s and 80s.
Candles, other than tallow, wax, and stearic manufactures	128s	240s and 192s
Tallow candles	96s and 48s	144s and 88s, 116s and 68s
Spirits	30f per hec	70f per hectolitre.
Liqueurs	30f per hec	80f per hectolitre.
Crushed apples and pears	not specified	12s
Earthenware and pottery, common, as retorts, crucibles, drain pipes, clay pipes, etc.	Ex	4s 10d and 3s 2d
Stoneware, chemical utensils, etc.	Ex	20s and 16s
Earthenware with ornaments in relief, etc.	Ex	40s and 32s
Fine earthenware, one colour, or painted	64s	80s and 72s
Porcelain, decorated	160s	240s and 200s
Porcelain, decorated, extra thick.	96s	144s and 120s
Porcelain, parian	160s	240s and 200s
Plate glass, 1 m square or more..	If per sq m	2f 50c and f2.00 per sq m
Plate glass, 1 m square or more, polished	3f per sq m	f6.00 and f5.00 per sq m
Table glass, one colour	28s	40s and 32s
Table glass, cut or engraved	80s	120s and 96s
Glass tiles, duller	not specified	40s and 36s
Glass—window, coloured, polished or carved	120s	200s and 160s
Vitrifications and enamels	30s	48s and 38s
Glass beads, etc., imitation stones	96s	240s and 200s
Glass bottles, full or empty	24s	36s and 28s
Other articles of glass	148s	300s and 240s

SULPHUR EXPORTS FROM ITALY.

FROM the 1st January to the end of September, this year, the imports of raw and refined sulphur into Italy only amounted to 229 quintals, valued at 1,603 lire, against 223 quintals, for 1,561 lire, in the same period of last year. In the same time, however, the exports have reached 2,557,482 quintals, compared to 2,528,609 in 1889, the gross value being returned at 17,902,374 lire for the first mentioned amount, and 17,700,263 lire for the second. Contrasting 1890 with 1889, therefore there has been an extension of the exports by 28,873 quintals, and 202,111 lire value. In the appended table the international distribution of the exports by quantity is shown for the first nine months of the last three years :—

Exported to.	Quintals. 1888.	Quintals. 1889.	Quintals. 1890.	Difference 1890 on 1889.
Austria-Hungary	97,955	93,748	136,341	+ 42,593
Belgium	57,738	70,505	41,042	— 29,460
France	429,437	472,204	516,350	+ 44,146
Germany	130,228	162,791	125,441	— 37,350
Great Britain	309,514	285,992	222,069	— 63,923
Greece	116,369	103,385	140,433	+ 37,048
Holland	10,745	19,337	13,076	— 6,261
Portugal	111,420	131,605	173,246	+ 41,641
Russia	182,920	159,078	138,619	— 20,459
Spain	56,370	58,790	52,060	— 6,730
Sweden and Norway	31,786	32,407	47,911	+ 15,504
Turkey	12,679	29,763	65,004	+ 35,421
North America	894,952	873,561	841,553	— 32,008
Central and South America	7,644	7,856	3,393	— 4,463
Other Countries	22,464	27,590	40,944	+ 13,354
Total	2,472,221	2,528,609	2,557,482	+ 28,873

By a simple process of substraction it will be found on comparing the above totals with those we published last month, that the exports during September alone must have amounted to 282,593 quintals, being 46,078 quintals, and 83,438 quintals beyond the exports in the same month of the two preceding years.

(1 Quinta' = 100 Kg. = 196·84 lbs. avdp.)

HOW METAL WARES ARE COLOURED.

SMALL metallic articles, buttons, clasps, buckles and others, have different coloured films produced on them by various methods. Some of these are known as oxidised silver. Rainbow colours are produced on brass buttons by stringing them on a copper wire and dipping them in a bath of plumbate of soda freshly prepared by boiling litharge in caustic soda, and pouring it into a porcelain dish. A linen bag of finely pulverized litharge or hydrated oxide of lead is suspended in the solution, so as to keep up the original strength of the solution. While the buttons are in solution, they are touched one after the other with a platinum wire connected with the positive pole of a battery, until the desired colour appears. The galvanic current employed must not be too strong. The colours are more brilliant if they are heated after they have been rinsed and dried. Coloured films are more conveniently produced upon bright brass by different chemicals, by painting with them, or by immersion. For example: Golden Yellow.—By dipping in a perfectly neutral solution of acetate of copper. Dull grayish green.—Repeatedly painting with very dilute solution of chloride of copper. Purple.—Heating them hot and rubbing over with a tuft of cotton saturated with chloride of antimony. Golden red.—A paste of four parts of prepared chalk and mosaic gold.

In covering an article with any coloured bronze in powder, it is first rubbed with a very little linseed oil, and the bronze is dusted evenly over it from a dust bag. It is afterward heated in an iron pan to about 480 degrees Fahrenheit. In recent times small articles are also roughened by dipping in strong nitric acid, and, after washing and drying, they are coated with a rapidly drying alcohol varnish that has been coloured yellow with picric acid, red with fuchsine, purple with methyl, violet or dark blue with an aniline blue. This gives the desired color with a beautiful metallic lustre. These colours are not very durable and are for inferior goods.

A NEW INDUSTRIAL APPLICATION OF MINERAL PHOSPHATES.

UP to the present time calcined bones have been the only materials employed for the manufacture of phosphorus. Natural phosphates are, however, now about to be employed for this purpose. For this object they must be rich in phosphorus and as poor as possible in lime and iron. The most important are the apatites of Canada, Spain, Norway, the department of La Somme and the phosphates of Redonda. This last material contains 35% of phosphoric acid.

The first operation is the preparation of phosphoric acid. For this purpose the finely powdered phosphate is treated with sulphuric acid in large tarred casks provided with a wooden mixer, steam being blown into the mixture. After some hours, the solution of phosphoric acid, which has a sp. gr. of 1·97, is separated from the calcium sulphate by filtration, and the lather washed until the washings show 0·01. The solution of phosphoric acid to which the washings have been added is then placed in spherical vessels, lined with lead and provided with agitators, in which it is heated by high pressure steam. During the concentration, calcium sulphate is deposited and the liquor has therefore to be run off into a second evaporator. About 25% of powdered wood charcoal or coke is then added to the clear liquor and the mixture heated in pots or iron muffles to free it from moisture and sulphuric acid ; it is then introduced into refractory earthern retorts, connected by iron and copper tubes, with condensing apparatus supplied with hot water, so that the phosphorus which distils over fires and falls to the bottom of the receiver. The distillation lasts 15 hours, the retorts being placed in a furnace like that employed in Belgium for zinc smelting.—*L'Engrais.*

CAUSE OF FIRES IN CHEMICAL LABORATORIES.

THE chemical manufacturing trade will be interested in the report of Inspector William McDevitt, inspector for the Philadelphia Fire Underwriters' Association, upon the H. H. Mulford fires. A fire occurred (we quote from the *Oil Paint and Drug Reporter*) September 15th, 1890, in the laboratory of H. H. Mulford and Co., on Eighteenth-street, below Market-street, Philadelphia. The firm manufactured pharmaceutical preparations, including tablets of the various compositions generally used, the powders being triturated and compressed on the premises. The powders were laid on trays formed of wood frames with cloth bottoms ; upon these trays the powders were dried in a dry-room divided into sections in closet form, the whole structure being heated by steam pipes laid near the floor in the dry-room. The fire was seen issuing from the bottom of the dry-room, and spreading rapidly, destroyed the entire building, causing an insurance loss of over 55,000 dols. The inspector says : "An investigation developed the fact that many who handle such materials as were used in the laboratory are unaware of certain fire dangers in connection therewith. Among the materials used were chlorate of potash and sugar, both of which were exposed to the drying process. While it may be generally known that chlorate of potash along with organic matter forms a powerful explosive, it should also be known that under certain conditions it is an agent in producing fire without explosive effect. Sugar alone requires a temperature of 600° F. to ignite it, but when mixed with chlorate of potash the mixture will ignite at 300° F. While the temperature of the dry room may not be above 200° F., the metal steam pipes may be 300° F. ; and if an accumulation of dust or particles of the two ingredients named should form a mixture on the steam pipes a fire will be produced, as was demonstrated by your inspector during the investigation.

"Upon inquiry, it was learned that the steam pipes were at times coated with dust of the various powders. My conclusions are that the accumulation of dust on the pipes was the cause of the first fire. Upon resuming business, Mulford & Co. leased the building No. 2,132, Market-street, where they had again commenced manufacturing their former preparations. On October 15th (a few weeks after the previous fire), an explosion occurred during business hours in the mixing room on the third floor, resulting in the falling out of the side wall of that storey, injuring a number of employés and setting fire to the building, which damaged the two upper floors (loss not yet determined). The firm had adopted a new method of drying by heated air from a heater in the cellar ; the air to be carried by conductors to the dry room. This plan had not been perfected, and gas stoves and a lamp were being used temporarily ; no material, it is said, being placed in the sections containing the lights.

"Although a number of employés were in the room, no definite information could be received from them as to the cause or exact location of the explosion, except that it started in or near the dry room. The oil lamp was found in good condition after the fire. Theories were advanced of the igniting of escaping gas from one of the stoves, the flame of which might have been extinguished in some way. The exact temperature of the dry room could not be ascertained which fact is of importance along with other theories of the cause. Upon inquiry, it was learned that a tablet composed of chlorate of potash and muriate of ammonia was one of the many compositions which the firm had at times made.

"In September, 1881, your inspector witnessed the remains of a fire in the store of Wyeth & Brother, on Walnut-street, the fire having originated among a mass of tablets composed of chlorate of potash and muriate of ammonia, from which, owing to timely discovery, only a small loss resulted. Since that time a record has been kept of similar occurrences ; the last resulting in an explosion in one of our leading drug stores, fortunately resulting in no injury to person or damage to property. These accidents led to an abandonment of the manufacturing or storing of the above mentioned articles by many druggists.

"While no positive cause can be found for the last fire in Mulford & Co.'s establishment, we think the manufacture of the chlorate of potash and muriate of ammonia tablets should be restricted or prohibited. The primary cause of both fires may be attributed to a forcing in the process of manufacture owing to a rush of business with this firm. With the discontinuance of the manufacture of the above mentioned tablets, and the introduction of proper arrangements and regulations, I can see no reason why there should be any more danger of fire on the premises of this firm than on those of many others engaged in similar business."

THE COLLECTION AND DISPOSAL OF TOWN'S REFUSE.

AT a joint meeting of members of the North-Western Branch of Medical Officers of Health, and of the Manchester and Salford Sanitary Association, Superintendant Whiley read a short paper on the collection and disposal of town refuse. In the course of his remarks he said that where a sanitary authority had to deal with 30,000 tons of refuse per annum, a farm of at least 600 acres of arable land should be obtained whereon to utilize it. As to privy closets and middens open to the sky, they ought not to be allowed to exist, and sanitary authorities should take the earliest opportunity of converting them into something better, say the pail system, which he preferred ; even water closets would be better. Although he believed that this city would some day be a water closet town, yet it would be a long time before such a change occurred. In the first place the water supply was not sufficient, and never had been. Neither were the drains adapted for such a method, but as a new system of sewers were now being constructed, and an abundant supply of water was expected shortly, the present water closets would no doubt be replaced. In Manchester with its half million of people we had all varieties of streets and closets within the boundary. There were over 600 miles of streets, the greater number of them paved with sets. There were 23,252 privies, 13,439 middens, 75,544 pail closets, 44,889 dust bins, 21,774 water-closets, and 108 cesspools. The Health, now Cleansing, Department of the Corporation had tried every known method of disposal, and without exception all of them had been objected to on some ground or other. At Holt Town works, which were objected to, were easily disposed of about 80,000 tons of refuse, which was made into portable manure. After deducting the cost of collection, the works last year produced a profit of over £2,000. The Carrington Estate, to which the Corporation sent 40,000 tons of nightsoil and found employment for 120 extra men, had been objected to by the authority of the district, who complained of stuff being sent there which local farmers would be delighted to have for their land. The Corporation had paid £40,000. for a tip at Clayton, and before anything worse than street sweepings had been tipped there the principal residents complained about the matter. Until recently the pails in Manchester were collected in the daytime, but the citizens demanded that the work should be done during the night, and now there was an agitation for a return to day work. It was a most difficult task to please everybody. The material to be dealt with was most offensive in its production, collection, and manipulation. It was offensive, no matter what was done with it, and everybody wished it to be removed as far away from them as quickly as possible. There were several Manchester townships which had neither system nor depôt, but they expected, and even demanded, that their refuse, no matter how offensive, should be taken far away from themselves, not caring whether the stuff became objectionable to their neighbours. Personally he would insist upon the authority in each township dealing within itself with its own refuse and if it became necessary to send any portion outside a district, that an area, sufficiently large, should be procured, whereon the material could be utilized and dealt with without offence to anyone. There were great difficulties, he was aware, in the way of procuring land for this purpose. Landed proprietors objected to sell except at a fabulous price, and even the Government would not dispose of Crown land for the purpose.

TREATMENT OF FOUL WATERS.

FOR treating foul waters, Liesenberg and Standinger propose a new precipitating material, which is a solution of a phosphate in sulphurous acid. The solution is obtained by having the phosphate in a sufficiently fine state of division suspended in water, into which sulphurous acid gas is passed to saturation. Details as to what phosphate is used are not given, but it is evidently some form of phosphate of lime, for the resulting solution is said to contain phosphate and acid sulphite of calcium. The addition of such a solution to foul waters is said to produce a voluminous precipitate which is easy to filter, and which lays hold of and retains colouring matters and some portion of organic matters. The sulphurous acid is, besides, useful on account of its well-known deoxidising and antiseptic qualities.

A METHOD OF SOAP ANALYSIS.

By Dr. T. Pinette.

THE following method embodies a simplification of the usual process of soap analysis. It requires a separating funnel such as is used by B. Röse in his method for the estimation of the fat in milk. This is provided with a stopper and tap, holds about 230 cbc., and is graduated up to 200 in half cbc. Such a funnel is useful for many purposes, and should certainly be employed. The analysis is carried out by dissolving 2 grms. of soap in boiling alcohol free from acid; if any matter is left undissolved, it should be filtered off and examined. A few drops of phenolphthalein solution are then added and, if any red colouration is produced, the free alkali determined by decinormal sulphuric acid. The neutralised liquid is diluted with water to about 80 cbc, and transferred to the separating funnel. As soon as the liquid has cooled to the temperature of the air exactly 10 cbc. of normal sulphuric acid are added, and the funnel filled up to the 200 cbc., mark with a mixture of equal parts of ether and light petroleum. The moistened glass stopper is then inserted, fastened down with string, and the whole vigorously shaken until the fatty acids have completely dissolved. After allowing the funnel to stand for some time the volumes of the aqueous solution and the ethereal solution are read off.

To determine the fatty acids, 25 cbc. of the ethereal solution are removed by a pipette to a weighed basin, the liquid evaporated, and the residue dried and weighed. It can then be further examined if required; *e.g.*, it may be dissolved in alcohol, and the saponification equivalent determined by titration.

The alkali, combined with the fatty acids, is estimated by drawing off the acid aqueous solution by means of the tap, and determining the excess of sulphuric acid in 25 cbc. by titration with decinormal caustic soda. All the data are then obtained for the calculation of the alkali. The potassium and sodium may be separately determined by evaporating the neutral solution in which the alkali has been determined, heating to redness and weighing. As the sulphuric acid in the mixture is known, the potassium and sodium present can easily be calculated. The amount of soda added in titrating the excess of sulphuric acid must, of course, be subtracted from that found in order to give the quantity present in the soap.

The advantages of this process are mainly that it avoids the wearisome washing and filtering of the fatty acids, that at least three determinations can be made of fatty acid and alkali in the same sample, and that if required portions of the liquid may be submitted to further examination.

THE INDIGO CROP IN THE NORTH-WESTERN PROVINCES AND OUDE.

THE final report on the crop of 1890 is as follows:—

Area: The patwaris at the time of their April tour recorded 254,086 acres under indigo this year, against 288,782 acres recorded by them last year, The Canal Department returned 198,994 acres as receiving canal irrigation up to 31st. of May, and 228,044 acres as receiving canal irrigation at the end of July, 1890. Last year, the canal-irrigated area of indigo at the end of May was 206,488, and at the end of July, 225,245 acres. The rains, from their commencement in June, proved too heavy and continuous for asarhi sowings, and the estimates received from zemindars for this year place the total indigo area at 290,000 acres, or about 12 per cent. less than the area of 1889.

Condition: The showers of March greatly helped the young crop in its first start, and it experienced little or no damage from the particular insect which usually attacks it at this stage of its growth. But on low land, the crop later on suffered much from the heavy rains of July and August, and the present has been the worst season for indigo during the last ten years. The average "condition" of the crop in each of the undermentioned tracts is thus reported:—

	Average condition in 1890, 100 representing a full average.
Doab	44
Rohilkund	56
Benares	50
Oude	45

Outturn: Last year it was estimated that 10 per cent. of the entire indigo area is annually reserved for seed, and that the average yield of dye per acre in a fairly good year is about a quarter of a factory maund. Adopting these estimates this year, and applying them to the reported area and condition, the total production of indigo dye for 1890 may be put at 32,600 factory maunds, against 53,700 maunds estimated last year. It may, however, be remarked that the exact area reserved for seed in any year is a very variable quantity. The Behar factories depend on the Punjab and the Western districts of these provinces for their annual supply of seed, as good seed requires a drier climate than that of Tirhoot. If the price of seed is high, or is likely to rise, it may pay indigo growers in Meerut and Agra districts to go in for seed instead of dye.

THE AIR AND FOGS OF MANCHESTER.

A MEETING of the Town Gardening Committee of the Manchester Field Naturalists' Society was held last week in the Reference Library committee rooms, King-street, the Chairman (Mr. T. C. Horsfall) presiding. A sub-committee, consisting of Dr. G. H. Bailey, Owen's College; Dr. J. B. Cohen, Owens College; Dr. J. Tatham, medical officer of health for Manchester; and Mr. P. J. Hartoy, Owens College presented a report on the air and fogs of Manchester and Salford. The information on this matter, the Sub-committee said, was at present extremely meagre. They proposed to set up apparatus for analysis at once at the Town Hall, Owen's College, in Hulme, in Ancoats, in Strangeways, and in Salford. The experiments will be conducted so as to afford definite information on many points of great importance to the community, such for instance, as: 1. The composition of the air in densely populated districts, as compared with that in thinly populated and suburban districts. 2. The relation between atmospheric impurity and prevalent sickness and mortality. 3. The amount and distribution of those impurities which are known to be specially prejudicial to plant life, *e.g.*, sulphurous acid. 4. The extent to which smoke and noxious gases are due (*a*) to dwelling houses, (*b*) to factories. 5. The nature of fog and the character of the air during the prevalence of fog. To cover the necessary expenses £200. will be required. The Sub-committee propose to work in concert with a similar body in London.—In order to defray the cost of these important experiments, and the planting of boulevards in certain centres of Manchester, a special appeal to the public for the raising of £700. was decided upon, and it was intimated that close upon £100. had been already promised.

TESTING FOR TRACES OF COPPER.

PERHAPS no metal, which may be dissolved by water, is so injurious to the generality of colours, as copper, and that when it is present in exceedingly small quantities. It happened lately to a German chemist, Hermann Thoms, to have to examine a sample of distilled water which had been tested in the usual way, and found pure, but when used for dissolving iodide of potassium, it gave a faint yellow coloured solution instead of a colourless one. Upon closer examination, the water was found to contain an infinitesimally small amount of copper, so small as not to give any reaction with ammonia, or prussiate of potash, and it was discovered that it was this which caused the yellow colour with iodide of potassium. One part of sulphate of copper in 100,000 parts of water gives no perceptible colour with ammonia, but still a just visible brown shade with yellow prussiate, but with iodide of potassium a yellow shade quite appreciable; in 200,000 parts of water prussiate shows nothing, but iodide shows a feeble yellow, which, however, becomes distinctly blue upon addition of starch paste; in 500,000 parts of water the iodide no longer gives any change of colour, but addition of starch paste gives a visible blue. The iodide is therefore a very delicate reagent; it seems to act by formation of cuprous iodide, and liberation of iodine.

NOTES ON WOOL.

THE following brief notes concerning wool are taken from a *resume* by Stricker, of a long paper by Dr. Horwitz, there is nothing particularly new in them, but in some points the writer seems to speak from personal knowledge.

The lime and magnesia insoluble soaps arising from the use of hard water with soap, deposit more largely upon wool than any other fibre. This comes from the structure of the wool; its fibre being covered with what may be called scales, it is upon and between these scales that the insoluble soap deposits. As a very alkaline soap causes the opening of these scales wider than a less alkaline one, the deposition of insoluble soap is thereby increased. Stains are produced in dyeing; in fact, regular and even shades cannot be dyed upon such wool.

The author has observed, says the *Textile Recorder*, in his experience that a soda soap acts less harshly upon wool than a potash soap, the actual alkalinity of the soaps being equal.

The felting of wool has been by most authorities ascribed to the so-called scales on the fibre. Fibres with the sales sloping in opposite directions would adhere and stick together by the scales becoming locked. Horwitz does not agree with such a theory of felting; he thinks it is sufficiently clear that the greater or smaller disposition to felt lies in the kind and number of the scales, and even of their degree of fineness. The use of acids and acid salts cause the so-called scales to rise up, and their extremities to be at a greater distance from the axes of the fibre, some salts, called mordants, are used to promote felting, in the case of rabbit hairs; but the lying in opposite directions does not, to Horwitz, seem a necessary condition.

As to the existence of sulphur in wool, Chevreul was of opinion that it was not an essential constituent of the fibre, but Grothe and others have a different opinion, and declare that the whole of the sulphur cannot be removed without changing the character of the fibre; the percentage of sulphur varies in different wools from 3·84 as a maximum to 0·87 as a minimum. The coarser wools contain more sulphur; very fine wools contain the least amount of sulphur.

The presence of sulphur allows of a test to distinguish wool from other fibres. By boiling the fibre with solution of carbonate of soda and a little acetate of lead, the liquor becomes dark-coloured from formation of the black sulphide of lead; this darkening does not take place with other fibres.

The manner in which sulphurous acid acts in whitening wool is not yet known with exactness. Some writers say it is simply a reduction of the yellow shade in the way of deoxidation, others that there is formation of a colourless combination of the colouring matter and the sulphurous acid, which, by treatment with alkalies, can be decomposed. Inconsistent with this latter statement is the direction that, as sulphurous acid left in wool would oxidise in time to sulphuric acid, the whitened wool would suffer and become weak; it should therefore be carefully washed, and even to make safe should be treated with a weak alkaline bath. In fact, if the sulphur is not left in the wool, the white is not bright; while wools bleached by sulphur have always a faint acid reaction, but the acid is too feeble to injuriously affect the strength of the fibre.

Good soap and carbonated alkalies have no injurious action upon wool, but these are seldom free from caustic alkali, and it is of the highest importance to know how much is present. Silicate of soda is sometimes added to soap; it is said to be a very injurious matter; the silicic acid separates and ruptures the so-called scales, leaving the wool more apt to fix the lime and magnesia salts, and give rise to stains.

Wool is a very hygroscopic substance. It is sold generally with 15 to 18 per cent of moisture. Stored in damp places, it may acquire 30 to 40 per cent. of moisture. According to some authorities, the quantity of moisture is greater in wool free from grease than in wool containing grease or fat.

ENAMELS FOR IRON AND OTHER METALS.

By PETRIK.

WHEN the enamel becomes separated from the metal, or when the iron bends away from the enamelled side. *i.e.*, when the contraction of the enamel on cooling, is less than that of the iron, one of the following alterations must be made in the composition of the enamel:—

(*a*) Increase the amount of silica.
(*b*) Replace part of the boric acid by silica.
(*c*) If lead is present, replace part of the lead oxide by alkalies or alkaline earths.
(*d*) Replace part of the alkaline earths by alkalies.
(*e*) Increase the alkalies and diminish the boric acid.
(*f*) Instead of tin oxide, use bone ash.

If the enamel breaks, and the iron bends towards the enamelled side, and the contraction of the enamel is therefore greater than that of the iron, the constituents must be altered in the opposite sense. The following relations by weight give, according to Petrik, good and reliable enamels:—

	Pbo.	Na_2O.	$Si O_2$.	B_2O_3.	$Sn O_2$.	Ca O.
I.	30·8	18·5	47·1	3·6	—	—
II.	15·4	18·5	47·1	3·6	15·4	—
III.	32·4	6·0	58·1	3·4	—	—
IV.	—	18·5	63·3	7·8	—	10·4
V.	—	18·5	36·7	14·0	30·8	—

	Na_2O.	$Si O_2$.	B_2O_3.	$Sn O_2$.	Bone Ash.
VI.	18·5	52·1	14·0	15·4	—
VII.	18·5	36·7	14.0	—	30·8
VIII.	18·5	36·7	14·0	15·4	15·4
IX.	18·5	52·5	14·0	7·7	7·7

The relation between tin oxide and Bone ash is of great importance. —*Monit. de la Ceramique et de la Verrerie, 1890, 21, 99.*

EMPLOYERS' LIABILITY.

AN employer is made liable under the Act of 1880 for accident happening to a workman by reason of any defect in the ways or works connected with or used in his business. It is sometimes a matter of difficulty to decide what is covered by these words, as appears from the recent case of *McShand v. Baxter and others.* There the plaintiff had been in the employ of the defendants, who were copper smelters, as an unskilled labourer upon their works at St. Helens, Liverpool, and his work was about the furnaces. These stood upon a piece of waste ground, used only as a place of deposit for "slag" or refuse from the furnaces, and having a drain in which there was a large and deep hole, into which the plaintiff had fallen and been thereby injured. The plaintiff admitted that he knew of the hole, and that if he had kept to the proper beaten path he could not have fallen into it, but had turned the wrong way. The defendants' case was that this path was no part of their "ways or works," and was not used in or in any way connected with their business, so that they could not be held liable under the Act. But their other defence was still stronger, and turned upon the fact that there had been no negligence proved against them, while the plaintiff had, upon his own showing, been guilty of contributory negligence by going across the slag as he did, without carefully avoiding the hole he well knew to be there. The Divisional Court, consisting of Mr. Justice Hawkins and Mr. Justice Lawrance, reversed the verdict of the County Court jury, who had found for the plaintiff, with £75. damages, and entered judgment for the defendants. They did this on the broad ground that, even if the path and hole could be considered as being upon the "ways or works" of the defendants, which point they did not decide, it was clear the plaintiff could not succeed as he had put himself out of Court by contributing to his accident by his own negligence. The judges also seemed inclined to hold that the path would not have been any part of the "ways or works," as intended by the statute of 1880.

APATITE IN SWEDEN.

THE apatite discoveries in Northern Sweden, especially in the Gellivara district, continue to attract much attention, and have of late been examined and reported upon by a special committee. The members of this committee have now completed their report, but do not agree on all points. One of the experts holds that the apatite is in general so closely combined with magnetic iron ore, that it will be necessary to grind the ore, and separate the iron magnetically, but it is a question whether crushed iron ore is fit for the production of pig iron, at least so far as large and high blast furnaces are concerned. The largest deposits of iron ore and apatite contain from a few per cent. up to 10 or 11 per cent. of the latter; there is, however, also an ore in considerable abundance which contains 19 per cent. of apatite, and, finally, one which contains as much as 60 per cent. of apatite, but as to the extent of which no definite information has as yet been obtained. Another member of the committee is of opinion that the apatite itself is sufficient to make the breaking and further handling remunerative. The residue can, however, be subjected to further treatment, either a further crushing and separation, or smelting down with lime or quartz for the purpose of obtaining Thomas slag and phosphoric iron for the basic Martin process. The question of the apatite and other resources of Northern Sweden will, however, not be allowed to drop, and a large party of Swedish M.P.'s have lately visited these districts to examine matters for themselves.

SOCIETY OF CHEMICAL INDUSTRY.

LONDON SECTION.

THE section met as usual at Burlington House on Monday, December 1st, Mr. Tyrer presiding. The paper for the evening was by Mr. W. Webster, on the "Electrical Treatment of Sewage," and was read in his absence, owing to illness, by Mr. Worth. The process has been already made the subject of previous papers to other bodies, and a brief account of its principle will suffice. The sewage to be treated is passed through a brick channel provided with a number of cast iron electrodes connected in parallel. The E.M.F. used is 1·8 volts. The net result of the treatment is to precipitate the organic impurities, the action being partly chemical and partly electrolytical, though the exact nature of the reactions that occur is not fully known. The impurities settle out, and can be separated by subsidence, and the effluent run away directly or after simple filtration. Experiments had been made on a fairly large scale with London sewage, and the process was now being tried at Salford. With regard to the efficiency of the process, the reports by Sir Henry Roscoe and Mr. Fletcher were conclusive, the diminution of organic impurity amounting to 70-80%. This being admitted, the whole matter turned upon its cost. Data were available in this respect, but only those due to the inventor himself. Pending the publication of the result of the Salford trial they were, however, all that were forthcoming.

The sewage of Salford and Pendleton amounted to 10,000,000 gallons per 24 hours, and the plant requisite to treat this was reckoned to cost £16,000. This represents an output of about 400 T.H.P. Besides this must be remembered the cost of the cast iron electrodes, of which 5,000 tons would be required at £4. per ton.

The annual cost might be taken at £2,500. plus other £2,500. for depreciation of the cast iron plates. Should a perfectly clear effluent be needed, an additional £1,200, to £1,500. a year must be allowed for the cost of filtration. This was without assuming any value for the sludge, although it might, after drying and igniting, be used as a filtering material, consisting as it did, mainly of magnetic oxide of iron.

In the discussion, Mr. Bischoff dwelt on the difficulty of completely sterilizing a fluid like sewage by electrolysis, and doubted the efficiency of the process in this respect. Mr. Siller compared it unfavourably with the "A. B. C." process as used at Kingston, chiefly on the ground that the sludge appeared to have no manurial value. That derived from the treatment of Kingston sewage sold for 70s. per ton, and £3,400. worth had been disposed of during the 25 years the process had been at work.

Mr. Birch was anxious to know the cost per head of population of the Webster process.

Mr. Cross enquired as to the precise reaction which took place during electrolysis, considering that the effluent would be almost completely destitute of available oxygen.

Mr. Newlands thought many folks would be a little shy of electrolytical processes after their experience of one that had been exploited in connection with a material with which he had a good deal to do, viz., sugar. He himself confessed to being a little sceptical as to the success of the process

Mr. Cassal urged the desirability of completely removing the organic matter if possible, and incidentally condemned the plan at present used for London sewage, and yet more strongly the proposed scheme for conveying it straight to the sea. Colonel Jones thought too little attention had been paid to the considerable purification that could be effected by mere agitation and subsidence. The cost of electrolytic oxygen as a purifier caused Mr. Messel to fear that the process would scarcely be a cheap one. Mr. Trotter and Mr. Howard asked for information concerning the time necessary for treatment and subsidence, while the question of cost exercised Mr. Hutchinson greatly. So far from accepting the figures given by the author he estimated the cost of treating the Salford sewage at about £20,000. a year.

Mr. Worth, replying on behalf of Mr. Webster, said that he was scarcely competent to deal with many of the questions, but would submit them to Mr. Webster as soon as he was well enough to reply to them. He ridiculed the idea of seeking to make a profit out of sewage by the sale of the sludge or any other means, and said the only question of practical importance was how to get rid of it most cheaply. He could vouch for the effluent being permanent in character and innocuous even to fish. He thought Colonel Jones had somewhat overrated the clarifying effect of subsidence alone, and dissented from Mr. Hutchinson's estimate of cost of treatment. A vote of thanks brought a very lively meeting to a close.

SCOTTISH SECTION.

The second meeting of the new session took place on the evening of the 2nd inst. in one of the rooms of the Philosophical Institution, Queen Street, Edinburgh. Mr. Crum-Brown presided. The proceedings were opened by a paper on the subject of spontaneous heating, by Mr. R. R. Tatlock, city analyst of Glasgow, the same that was announced for the November meeting there, but fell out, owing to a misunderstanding as to the day of meeting. Mr. Tatlock pointed out the well-known circumstance that the union or contact of some carbonaceous substances with oxygen in certain ascertained proportions gave birth to active fire, or flame. Coal of particular kinds was notably subject to combustion under such conditions, and it was only through special testing, entered into with a special object in view, that there could be disclosed those sorts or grades of fuel that were sufficiently safe for purposes of storage, whether in the hold of vessels, or in coal repositories ashore. There was no reliance to be placed in ordinary commercial descriptions or distinctions here. The reading of the paper was followed by a conversation, in which it was pointed out that in certain conjunctions of inflammable materials there could be no outbreak of combustion without the added agency of vapour; the case of the haystack being cited, which was not known in any instance to have become spontaneously ignited, unless originally stacked in a condition of undue moistness. As regards carbonaceous substances, on the contrary, these might break into flame even when perfectly dry.

Mr. R. Irvine, Edinburgh, afterwards read a paper on "The Condensation of Smoke Particles," during which, in alluding to the persistent British practice of burning green coal in the application of domestic services, he emphasised the point that so long as we continued to do so, so long would the domestic smoke nuisances continue to be everyday familiars of ours. Partial mitigation, he admitted, might be obtained by resorting to the method of feeding the fire place with coal at the base of the combustion, instead of on the top of it as now. The effect produced would be, that, the incandescent fuel always maintaining the topmost position, only the less gross of the particles of smoke would escape into the chimney unconsumed. The new practice could not be carried out, however, without the introduction of a very special form of grate.

The attendance was very small, partly caused by the unfavourable condition of the weather. The usual complimentary votes were passed.

WHAT IS BONE MEAL?

By J. König.

THE author proposes to distinguish the various kinds of bone meal as follows:

1. Bone meals which are prepared from entire bones, which have not undergone any preparation for the boneware or gelatine manufacture by any of the recent fat-extraction processes, and contain 4—5·3 per cent. of nitrogen, and 19—22 per cent. of phosphoric acid, and in which after extraction with chloroform, the relation between nitrogen and phosphoric acid is found to be 1 : 4—5·5, receive the name of "normal bone meal," or "bone meal No. 0."

2. Bone meals which contain 3—4 per cent. of nitrogen, and 21—25 per cent. of phosphoric acid, and in which the ratio of nitrogen to phosphoric acid, after extraction with chloroform, is 1 : 5 5—8·5, are known simply as "bone meal"

3. Bone meals containing 1—3 per cent. of nitrogen, and 24—30 per cent. of phosphoric acid and in which the ratio after extraction is 1 : 8·5—30, are termed "degelatinized bone meal."

4. To these varieties must be added "raw bone meal," which is made in some districts by simply stamping the bones, and is therefore liked by farmers because its constituents, and therefore its purity, can be perceived with the naked eye. The bye-products from the boneware manufacture, however, are frequently freed from fat by extraction, and then sold as raw bone meal. This is, however, not to be recommended since it confuses the purchasers; only such meals should be termed raw bone meal as are actually made by breaking up raw bones.

5. Fertilizing meals, which after extraction with chloroform contain less than 1 per cent. of nitrogen in the form of bone-gelatine, and in which a smaller proportion of nitrogen to phosphoric acid than 1 : 30 exists, are no longer termed bone meal, but receive at the most the designation of "mixed fertilizing meal."

In addition to the above we have the fertilizing material obtained in the manufacture of beef extracts, which is sufficiently distinguished from bone meal in the sense defined above, by its name of "meat-bone meal," or "meat fertilizing meals."

If such a standard were adopted, the difficult question as to how much horn meal, hair, etc., *i.e.*, constituents removable by chloroform, is permissible, would be avoided, and the separate qualities of the commercial bone meal more accurately distinguished —*Landw. Vers.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

R.H M.—The numbers are out of print.

P.M.H —We cannot add to what we said last week. It is a simple matter for you to find out the proportions by experiments. Try molecular weights.

V.H.V.—We cannot publish the name.

G.M.B. (Athens).—The sample appears to be quite suitable. As to sulphuric acid, you had better send fuller particulars. We could then advise.

W.L.H.—About 0·6 per cent.

J.P., Water Gas, B. & Co.—Suitable for advertisements.

*** *We do not hold ourselves responsible for the opinions expressed by our correspondents.*

NITROUS SULPHURIC ACID AND SULPHATE OF AMMONIA.

(To the Editor of the Chemical Trade Journal.)

Sir,—It is a matter of common knowledge that makers of sulphate of ammonia object to the presence of nitrous compounds in the sulphuric acid used by them. The reason generally assigned is that it causes discolouration of the sulphate produced. Is there any good ground for this opinion? Judging by the facility with which, in the concentration of vitriol, sulphate of ammonia destroys nitrous compounds with formation of H_2O and evolution of nitrogen, it is somewhat difficult to understand how these same nitrous compounds can prejudicially affect the colour of sulphate of ammonia in the manufacture of this salt. Is not the above reaction (mutual decomposition of sulphate of ammonia and nitrous compounds) the real and only valid reason for objecting to the presence of nitrous and nitric acid in sulphuric acid?

Yours &c, W.M.

Newcastle-on-Tyne, Nov. 28th, 1890.

NOTICE.

We have commenced a series of Lectures upon popular chemical subjects, in connection with the Permanent Chemical Exhibition and Manchester Technical Laboratory. The lectures will be given at 7-0 p.m. on the first Tuesday in each of the following months; they will be illustrated by experiments and by diagrams, and have reference to exhibits in the Permanent Exhibition. The lectures will take place as under:—

February 3rd.—"Chlorine Production."

March 3rd.—"Sewage Treatment."

Tea and coffee at 6-30 p.m. in the Exhibition room.

We have decided to reserve seats for such of our friends as may give us a week's notice (by post-card) of their intention to be present. After this we shall issue a general invitation, and do our best to accommodate those who accept.

Trade Notes.

"The first chemical works in the North of England, affected by the Chemical Union, are about to be dismantled. Messrs. Snowball and Co., Side, Newcastle, having been engaged to dispose of all the plant at the Tyneside Chemical Works, Felling-on-Tyne."

Compressed paper is used now as a substitute for wood, in the manufacture of shuttles and their wheels, for looms. They are manufactured largely in Berkshire County, Mass.

A New Disinfectant.—Since we have learnt to be terrified by the ubiquitous microbe, means for combating him have multiplied and flourished. The latest disinfectant is called "lysol," and appears to be our old friend carbolic acid (whose reputation is seriously on the wane) emulsified, and thereby made more active. The emulsifying agent is an ordinary fat or resin soap, but the peculiarity of manufacture lies in the fact that the tar acid is incorporated with the soap at the moment of saponification. The customary proofs of efficacy are forthcoming, and duly chronicled in the German edition of the proceedings of the British Association which have recently been issued at Bremen.

Dyeing Silk.—A new process for the dyeing of silk has been patented in France. It consists chiefly in the use of a "reduction bath," which appears to consist of a concentrated solution of magnesium chloride, containing chloride of tin; any other saline body may be used, but the magnesium salt gives the best results. The saline body prevents the precipitation of the tin as oxychloride, which ordinarily happens when using tin crystals. After the silk has been passed in this bath, which contains one per cent. of chloride of tin, it is passed into a solution of catechu or other tannin products, whereby tannate of tin is deposited on the fibre, and the latter is weighed accordingly, and is also in a suitable condition for dyeing with the basic aniline colours. It is claimed that greater economy in the consumption of tin and catechu is effected by this process, also that the silk is more easily washed, less soap is required, and the tenacity and elasticity of the silk is better preserved by the fixation of the tin in the cold. The patent, however, specifies the use of baths at a temperature of 70°C., which is far from being cold.

The Middlewich Salt and Alkali Company, Limited.—The object of this undertaking is the manufacture of alkali by the Solvay process from natural brine. The share capital is £80,000., in 16,000 shares of £5. each. It is proposed to purchase twenty-three acres of freehold salt land at Cledford, near Middlewich, and to erect works for raising and manufacturing salt and alkali by the process named. An unlimited flow of brine on the property is stated to have been proved, and the report by an expert to that effect is appended to the prospectus. With the exception of the Cheshire Alkali Company, Limited, the only manufacturers working the Solvay process from natural brine, are Messrs. Brunner, Mond and Co., Limited, whose success is known, the company having paid since its formation in 1881 dividends averaging 25 per cent. per annum. The other company mentioned own only six acres of land, and from the fact that the present company possess 23 acres of proved brine land, have excellent facilities for transport, and are not tied, as the other two companies are stated to be, by reciprocal agreement, the one not to make salt for sale, and the other not to manufacture alkali by the Solvay process, success is anticipated. Practical men are now to be found admitting that the Le Blanc process is being superseded by the Solvay process, and that the cost of the latter is less than the former.

Iron and Steel for the World.—In a recent issue of the *Manufacturers' Record*, Edward Atkinson has an elaborate paper on the iron and steel interests of the country. He shows that the United States is the greatest consumer of iron and steel in the world. He believes that the world's consumption of iron and steel, which is now increasing so rapidly, will for the next ten years fully tax the productive powers of this and all other iron making countries to keep up with it, and hence, that while there may be fluctuations, prices on the whole must steadily tend upward throughout the world. Basing his estimates on careful calculations made by himself, by Abram S. Hewitt and others, he holds that the present world's production of 28,000,000 net tons of pig iron, of which the United States will make during 1890 about 10,000,000 tons, must within the next ten years, or in 1900, be increased to not less than 44,000,000 tons, even at the lowest possible rate of increase based on the rate of growth that has continued from 1856 up to the present time, while the rate of increase of late years, during which the demand for iron has broadened, would show that the world would need not less than 56,000,000 tons in 1900. These calculations are based on the normal rate of growth for the last 50 years, and do not take into consideration the possibility and the almost certainty of a greatly increased demand by reason of the opening up of Africa and Asia.

A Year's Strikes and What They Cost.—A report by Mr. J. Burnett, Labour Correspondent to the Board of Trade, on the strikes that occurred last year has just been issued. From this it appears that in 1889 strikes took place in 3,164 establishments in this country. As in 1888, and due to the same reason—namely, a rising labour market,—67 per cent. of the strikes were due to claims for advanced wages, although in some cases there were other points of dispute also involved. Of those for advances in wages 48·3 per cent. were successful. The proportion of those partially successful was 31·5 per cent.; 10·7 per cent. were not at all successful, and the results were unknown in the remaining strikes. Of the financial aspect of strikes some interesting particulars are given. Taking 597 of the strikes, the loss of wages is estimated at £652,000., while the loss to each individual would be a little over £3. 5s. For 930 of the strikes the loss for the 344,840 persons engaged is taken at £1,122,500. In 216 instances it is shown by employers whose men have been on strike that the value of fixed capital laid idle was £14,450,662; while in 169 instances the rateable value of property laid idle was £268,684. In 233 strikes the estimated outlay caused for laying down and reopening the works on strike was £169,219. On the other hand, the returns sent in by trade unions show that in 369 strikes the amount expended in support of men by strike committees or trade unions was £63,636. The returns also show that in 446 strikes the weekly wages earned before the stoppages amounted in the aggregate to £153,504; while the estimated loss of wages in 292 of these strikes was £294,175.

Gas Heated Boilers.—An investigation of the use of gas under steam boilers is said to show that, with the present method of boiler heating, it requires 2½ cubic feet of gas to evaporate one pound of water, but that, with the use of a proper burner, one pound of water may be evaporated by 1 38 cubic feet of gas. The same principle is declared to apply to the making of salt and the puddling of iron; that is, to puddle a ton of the latter, the mills use some 28,000 cubic feet of natural gas, while experiments show that the same work might be done with half that quantity.

Estimation of Indigo.—In *Romen's Journal* there is published a process for the determination of indigo, which is simple enough to be done in a works' laboratory, and may yield good results. One gramme is taken, ground as finely as possible dry, and then still further ground with water until the utmost degree of division possible is attained, transferrep to a flask marked in the neck at 250 cc., 3 grammes zinc poweer, and 6 grammes caustic soda added; it is stirred up from time to time, and the reduction will be complete in an hour or two. By means of a pipette 50 cc of clear liquid are drawn off, and placed in a shallow basin, and exposed to the air for 30 minutes, then an excess of hydrochloric acid added, the precipitated indigo collected on a filter, washed, dried, and weighed.

Fluorography.—Fluorography is a process of transferring lithographic or phototypic prints to glass by means of fluorated inks, which, in contact with sulphuric acid, disengages hydrofluoric acid, which eats into the glass. The phototype is inked with the following compound:

	Grammes
Soap	50
Glycerine	200
Tallow	50
Water	100
Borax	25
Fluorspar	50
Lamp black	15

Negatives are taken and transferred to the glass. The latter is surrunded with a border of wax and covered with sulphuric acid of a density of 64° or 65° Baumé. After fifteen or twenty minutes the acid is poured off and the glass is washed with water and cleaned with a solution of potassa, then washed with water again and dried with a cloth. According to the *Revue de Chimie Industrielle et Agricole*, this is the process that gives the best results.

Ferroid.—Ferroid is a new artificial stone, described by Mr. Herman Poole in the *Journal* of the Association of Engineering Societies as a compound, partly chemical and partly mechanical, of iron, sulphur, and silicon, with more or less foreign matter. "It is mainly a supersaturated solution of iron in the sulphur with the silica acting as a binder and hardener. Its normal colour is a dark slate, varying somewhat with the manner in which it is dressed, but the colour can be somewhat modified by the introduction of pigments. Successful imitations of various coloured brick and sandstone have been made. It is about the hardness of ordinary bluestone, and can be worked by the usual stone-cutting tools, turned in the lathe or planed. The tensile strength is from 650 to 1,200 lb. per square inch, and under compression it endures from 9,000 to 12,000 lb. Its specific gravity is about 2·6. It melts at about 300 deg. Fah. very slowly. It does not deteriorate under exposure to the weather. As it can be melted and moulded it is applicable to a great variety of uses to which stone cannot be put, and particularly so for large castings, such as pipes for sewage, &c. Architectural forms can be very conveniently made from it in position if needed. For culverts and bridge foundations the perfect smoothness of which the surface is susceptible is advantageous in lessening water friction."

Market Reports.

TAR AND AMMONIA PRODUCTS.

Owing to the demand for aniline oil and salt the market for benzole, particularly for early delivery, remains strong. Business in 90%, January-June delivery, has been done at 4s. 7d. and 4s. 7½d., 50% January-June can be bought at 3s. 6d.

Of anthracene there are no stocks worth speaking of. Anything offering at reasonable prices is quickly taken up by consumers. To-day's prices may be called 1s. 4½d. to 1s. 5d. for 30% A and 1s. 2d. for 30% B.

The past week has been marked by no material change in the condition of sulphate. Prices continue lowest at Leith, though the latest advices speak of a slight upward movement, from £10. 10s. to £10. 11s. 3d. At Hull and Liverpool the figures vary from £10. 11s. 3d. to £10. 13s. 9d., and it is rumoured that £10. 15s. has been touched. For forward delivery up to March, £10. 15s. is quoted at Leith, and as high as £11. at Hull, but no business has been done at the latter figure. Beckton prices are a shade lower than last week, and are practically the same as London outside makes at £10. 13s. 9d.

REPORT ON MANURE MATERIAL.

The market continues very quiet in all positions, and prices remain without any material alteration.

For December shipment there would probably be sellers of Bull River phosphate rock at 10½d. per unit, c.i.f., and of land rock at 10d. Florida rock is more freely offered, but manure manufacturers seem indisposed to make further purchases of any kind of phosphate at present, and a material concession would probably have to be made in order to induce them to buy in quantity.

Further cargoes of River Plate bones have, it is understood, changed hands at prices not reported, but probably at £5. 2s. 6d. to £5. 5s., delivered U.K. Crushed East Indian bones are selling at £5. 5. per ton, ex quay, Liverpool, on spot, and something less would do for shipment ahead. £5. 7s. 6d., ex quay Liverpool, lowest for East Indian bone meal for shipment ahead. £5. 10s. would have to be paid on spot for fine quality, though inferior parcels are offering at as low as £5. 2s. 6d. per ton. Rough grinding bones find a ready sale at £5. and upwards per ton, ex quay Liverpool. Nearest value of cargoes of River Plate bone ash is £5., nett cash, Hamburg terms.

Nitrate of soda is a shade firmer, owing to the renewed reports of combination for restriction of output, but no decided advance in price has as yet been scored. Spot remains at 7s. 9d. per cwt. for low test up to 8s. 1½d. for refined quality. Due cargoes are worth about 7s. 7½d. per cwt., and October-November shipments about 7s. 10½d., delivered U.K. or Continent.

There is nothing to report in dried blood or River Plate guanos.

Superphosphates remain without alteration, quiet but steady.

MISCELLANEOUS CHEMICAL MARKET.

Business in chemicals generally has been rather quieter during the past week. Bleaching powder keeps firm at £6. 12s. 6d. softwood, rails, and £7. hardwood, f.o.b. Soda ash, very firm, and not over plentiful for prompt delivery; we quote carbonated 1$\frac{7}{10}$ to 1½, and caustic 1$\frac{6}{10}$ to 1½ per degree, f.o.b. in usual casks. Caustic soda, in good demand at last week's prices. Saltcake, rather dull at 40s. rails, makers' works. Soda crystals, in good request at £3. to £3. 10s. per ton, according to packages. Chlorate of potash and soda keep very firm; the latter is difficult to obtain for prompt delivery, makers being well engaged with orders for some weeks ahead; values, potash 5½, soda 6¾. Sulphate of potash has freshened up a little, and altogether the outlook is more promising; £19. f.o.b. is about its present value. Sugars of lead continue dull, and there is no change in price; English white is offered at £28. 10s., foreign £23. 15s. c.i.f., brown £18. 10s. Acetates of lime keep in moderate request for prompt at £7. 15s. to £8. for brown, and £13. to £13. 10s. for grey. Acetic acids dull and unchanged. Bichromates well enquired after, and fair business doing at former prices. Carbolic acids still continue quiet, and there is no improvement in prices.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron steady. Scotch warrants closed at 47s. 1d. cash and 47s. 5d. one month. Middlesbrough, 43s. cash; hematite, 54s. 3d., cash. Copper was firm. Chili bars, G.O.B.'s and G.M.B.'s closed at £55. 7s. 6d. to £55. 15s. cash, and £55. 18s. 9d. to £56. 5s. three months. Tin steady; Straits closed at £91. 15s. to £92. 5s. cash, and £92. 5s. to £92. 15s. three months; Australian, £92. 2s. 6d., buyers, cash. English ingots, £95. to £95. 10s. Lead: Spanish, £13. 2s. 6d.; English, £13. 10s. Silesian Spelter: ordinary, £24. 5s. to £24. 7s. 6d. Quicksilver, first hands, £9. 5s.; second hands, £9. 2s. 6d. Copper shares: Copiapo, 2$\frac{7}{8}$ to 2$\frac{15}{16}$; Libiola, 2$\frac{7}{8}$ to 2$\frac{13}{16}$; Mason and Barry rose ⅛ to 7¼; Rio Tinto rose ½ to 23$\frac{19}{16}$.

GLASGOW, Wednesday.—Market firm, with fair business. Scotch done at 47s., 47s. 3d., and 47s. 6½d. cash, also at 47s. 5d., 47s. 6d., and 47s. 4d., one month; closing buyers at 47s. 4½d. cash, sellers ask ½d. more. Middlesbrough closes with buyers at 43s. cash, and 43s. 3d. one month, sellers ask 3d. more. Hematite done at 54s. 6d. 21 days and one month; closing buyers at 54s. 3d. cash, and 54s. 6d. one month, sellers ask 1½d. more.

WOLVERHAMPTON, Wednesday.—A slight improvement on the past few markets was observable this afternoon. Anticipations were expressed of the situation being still further benefited before long by a reduction in the Bank rate. Meanwhile, notwithstanding the depression in Glasgow, there is a fair amount of business doing locally, judging from the great demand that exists for railway waggons, and also from the fact that the weekly traffic receipts of the railway companies serving the district have shown an increase lately even upon the returns of this time last year, when the trade boom was in progress. Quotations unaltered.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

There unquestionably prevails rather more of movement in the general market, and as regards prices there are one or two changes to record. Sulphate of copper has for the time recovered the drop made a fortnight or three weeks ago, and now again quotes £18. 10s. The quotations for nitrate of soda are still very low, but there has been some slight pulling up, and the figure is now perhaps but barely nameable below 8s. Caustic soda in some of the strengths has receded a fraction, but is notwithstanding in a reasonably, firm position on the market, as are all the others in the section of the alkalies, although bleaching powder also may be described as slightly easier than it has been. In the paraffin products the feeling has taken itself up again, and the market is pretty firm, with paraffin spirit (naphtha) one penny a gallon higher all over, by agreement amongst the makers. For sulphate of ammonia it has continued a very dull and even dead time. From the surprising depression which had come about by the date of last report there was said to have been symptoms of a reaction as the week waned; but these, if they existed at all, were illusory, and this week has opened with the practicable Leith price still as £10. 10s. only, and some badly-bit holders much depressed over the situation. The Scotch makers of bichromate of potash and bichromate of soda are still very badly off for orders.

Chief prices current are: Soda crystals, 56s. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 2½%, Tyne; caustic soda, white, 76°, £13. 10s., 70/72°, £11. 5s., 60/62°, £10. and cream, 60/62°, £9. 12s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £8., and 1 cwt. casks, £8. 5s, net Tyne; refined alkali, 48/52°, 1⅜d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £30., and boracic acid, £37. 10s, net Glasgow; bleaching powder, £6. 10s. to £7., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5⅜d., less 5% any port; nitrate of soda 7s. 10½d. to 8s.; sulphate of ammonia, £10. 10s. f.o.b. Leith; salammoniac, first and second white, £37. and £35., less 2½% any port; sulphate of copper, £18. 10s, less 5% Liverpool; paraffin scale, hard 2¾d., and soft 2⅝d., per lb; paraffin wax, 120°, semi-refined, 3⅝d. to 3¾d.; paraffin spirit (naphtha,) 9d. a gallon; paraffin oil (burning), 6d. to 6¼d at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 5s. to £6. 10s., and 890/895°, £7. 10s. to £8. Week's imports of sugar at Greenock, were 38,078 bags.

THE COPPER MARKET.

Messrs. Harrington and Company's copper report, dated Liverpool, 2nd December, 1890, states:—Chili copper charters for second half of November are advised as 750 tons. The total charters since 1st January are 23,850 tons, against 21,000 tons for same time last year.

The financial atmosphere having become again clear and healthy, metals are gradually regaining what they had lost in values. Copper G.M.B.'s touched on the 19th, £53. 15s. and £53. 17s. 6d. cash and three months, but soon recovered again to £56. 10s. and £57. 2s. 6d. respectively, since when prices have been irregular, and yesterday £55. 5s. and £55. 15s. were accepted for cash and forward. To-day, we close steady at £55. 5s. to £55. 17s. 6d. respectively.

The "Speedwell" (s) arrived from Havre with 700 tons Chili bars, which were transferred to the Swansea stock.

The total decrease for the fortnight in the Liverpool, Swansea, London, and Havre stocks is 1,380 tons, and with 2,125 the previous fortnight, makes a decrease of 3,505 tons for the month.

The visible supply for the month of November is 65,440 tons, against 68,225 tons for October, thus showing a decrease of 2,785 tons. Same time last year the figures were 99,984 tons, making the decrease 34,544 tons for the twelve months.

The present stock of English G.M.B.'s in warehouse is 3,304 tons, against 3,524 tons on the 17th ult., 50 tons having gone into Swansea and 5 tons in Liverpool stock; the deliveries in Liverpool and Swansea were 275 tons, thus showing a decrease of 220 tons for the fortnight.

Refined and manufactured sorts are dull at £60. to £61. for tough, £63. to £64. for best selected, £64. to £65. for India sheets, £68. to £69. for strong sheets, and 6d. to 6¼d. for yellow metal sheets.

The sales of furnace material comprise at Liverpool—500 tons spot Argentiferous Anaconda matte on private terms; 1,000 tons ordinary Anaconda matte (re-sale), at 10s. 6d. to 10s. 9d.; 1,400 tons American matte (to arrive), at 10s. 9d.; 250 tons Argentiferous Montana matte (to arrive), on private terms; 220 tons Mexican ore, 10s. 9d.; 70 tons Portuguese ore (23 per cent), at 10s. 9d.; 38 tons Portuguese ore (10 per cent), at 10s. 3d.; and 300 tons Portuguese ore (6 per cent.), to arrive, at 9s. 3d. per unit. At Swansea—1,210 tons Cape ore, ex "Golconda," at 10s. 6d. per unit.

Import of Chili copper during the past fortnight, 572 tons fine, against 699 tons fine, same time last year; delivery of Chili copper during the past fortnight, 169 tons fine, against 2,062 tons fine, same time last year. Import of other copper during the past fortnight, 1,477 tons fine, against 4,010 tons fine, same time last year; delivery of other copper during the past fortnight, 2,324 tons fine, against 3,958 tons fine, same time last year.

The deliveries of Chili copper from Liverpool and Swansea amount to 869 tons, but in consequence of the transfer of 700 tons bars from Havre to Swansea (which will appear as a French delivery) they are reduced to 169 tons.

The total imports of Chili and other copper into Liverpool and Swansea since the 1st January have been 77,955 tons; deliveries during the same period 104,124 tons fine; for same time last year the figures were 89,356 and 89,564 tons respectively.

Quotations are, to-day, Chili bars, £55. 5s. to £55. 17s. 6d., 17th Nov., 1890, £55. 12s. 6d. to £56., 3rd Dec., 1889, £49. 15s. to £49. 12s. 6d., 3rd Dec., 1888, £77. 10s. to £78.; Chili ores and regulus, to-day, 10s. 6d. to 10s. 9d., 17th Nov., 1890, 10s. to 11s. 3d., 3rd Dec., 1889, 9s. to 10s., 3rd Dec., 1888, 14s. 4½d. to 15s. 6d.; Coro Coro Barilla, to-day, nominal, 17th Nov., 1890, nominal, 3rd Dec., 1889, 10s. 6d., 3rd Dec., 1888, 15s. 9d.

THE TYNE CHEMICAL REPORT.

TUESDAY.

The chemical market continues quiet, with only a limited amount of business doing. Bleaching powder is being offered by second hand under Union prices for this month's delivery. Caustic soda has been reduced 5s. per ton for prompt. Soda crystals and soda ash, steady, without any change in price.

It is reported that the Tyneside Chemical Works at Filling-on-Tyne, are about to be dismantled, instructions having been issued by the Chemical Union to this effect. The works have been standing idle for some five or six years, so that the production of chemicals will not in any way be affected.

The following are the market quotations of to-day:—

Bleaching powder, in softwood casks, £6. 15s. per ton; in hardwood casks, £7. per ton, less 3½%. Caustic soda 77%, solid, in drums, £12. per ton, nett; ground and packed in 3-4 cwt. barrels, £16. per ton, nett; 70%, £11. 5s. per ton, less 3½%; soda ash, 48/52%, 1⅜d. per degree less, 3½%; white alkali, 1⅜d. per degree, less 5%; soda crystals, 56s. per ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; ground and packed in casks 53s. per ton, both less 3½%; recovered sulphur, packed in 2 cwt. bags, £5. per ton, nett; chlorate of potash, 5½d. per lb., less 5%; silicate of soda, 75° Tw., £2. 15s. per ton; 100° Tw., £3. 10s. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. 10s. per ton; in 5-7 cwt. casks, £6. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £7. 15s. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton; carbonate of alumina, £27. 10s. per ton; aluminate of soda, £32. 10s. per ton; hydrate of barium, £8 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

The market for Northumberland steam coal is very easy with inferior qualities offering from 4s. 9d. to 5s. per ton, delivered into craft, for better qualities prices range from 5s. 6d. to 6s. per ton. Durham small, steady at 6s. 6d. to 7s. 6d. per ton, delivered into craft at Staithes.

New Companies.

ABERGWAWR BREWERY COMPANY, LIMITED.—This company was registered on the 26th inst., with a capital of £25,000., in £1. shares, 10,000 of which are 7% cumulative preference shares, to acquire the business carried on by Taliesin James at the Abergwawr Brewery, Aberaman, Glamorgan. The subscribers are:—

	Shares.
C. J. Jackson, Cardiff, barrister	100
G. Hopkins, Cardiff, merchant	100
D. T. Alexander, Cardiff, auctioneer	100
T. F. Peet, Bristol	100
T. J. Masters, Cardiff, clothier	100
R. P. Culley, Cardiff, refreshment contractor	100
J. Allan, Cardiff, contractor	100

Pontefract Coal Saving Company, Limited.—This company was registered on the 24th inst., with a capital of £2,000., in £1. shares, to acquire a business carried on at Tanshelf, near Pontefract, in connection with the letters patent No. 1,556, dated 29th January, 1890, for improved fuel-saving composition. Solicitors, Messrs. Carter, Atkinson, and Bentley, Pontefract.

R. D. Harrison and Company, Limited.—This company was registered on the 22nd inst., with a capital of £9,000., in £10. shares, 300 of which are 10 per cent. cumulative preference shares, to purchase the business of Robert Dex Harrison, tanner, currier, combing leather maker, and manufacturer of other leather articles. The subscribers are :—

	Shares.
W. Gawthorp, Moorhouse, Oxenhope, York, commission wool comber	20
W. H. Greenwood, Bradford, wool comber	20
J. W. Firth, Ilkley, wool comber	20
T. Slingsby, Keighley, worsted spinner	20
J. Hartley, Morley	20
E. Schutt, Bradford, general merchant	20
J. Shaw, Stancliff	10
H. Portway, Bradford, commercial agent	20

Woking District Gas Company, Limited.—This company was registered on the 24th inst., with a capital of £20,000., in £5. shares, to carry on the business of a gas company at Woking. The subscribers are :—

	Shares.
G. B. Holroyd, Byfleet, brewer	1
R. Ashby, Summerhill, wine merchant	1
J. Church, C.E., 55, Parliament-street	1
H. W. Andrews, 15, Albion-road, South Hampstead	1
E. B. Smallpiece, F.S.I., Woking, surveyor	1
B. D. Holroyd, Byfleet, chartered accountant	1
J. V. Mackenzie, 26, Melton-road, South Tottenham, clerk	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

Kemp and Tabberner, Birmingham, drysalters, and oil and colour merchants.

H. Ingleson and S. P. W. Bottomley, under the style of H. Ingleson and Co., Bradford, oil and varnish merchants, and boiler composition manufacturers.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

Hill, Andrew Hawksley, trading without a partner as Green, Hill, and Co., Fairfield and Liverpool, whiting and acid merchant.

Thomas, John Evan, Llandovery, chemist.

Adjudications.

Kirk, Joseph Moxon, Halifax, and Kirk, Henry John Percy, Parkstone, trading as J. M. Kirk and Sons, Halifax, dyers and finishers.

Lowe, William, Wordsley, glass maker.

Moore, Harriette, trading as the Portmadoc Mineral Water Co., Portmadoc, late of Birkenhead, and Borthygest, mineral water manufacturer, wife of W. H. Moore, trading apart from her husband.

Thomas John Evan, Landovery, chemist.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Dynamos.—(Complete Specification.) R. Kennedy. 18,491. November 17.
Aluminium Alloys. J. Johnson. 18,508. November 17.
Explosives.—(Complete Specification.) J. S. Walter. 18,519. November 17.
Colouring Matters.—(Complete Specification.) J. Imray. 18,526. November 17.
Manufacture of Ultramarine. O. Imray. 18,527. November 17.
Charging Liquids with Carbonic Acid. J. C. Fell. 18,540. November 17.
Rotary Calcining Furnaces.—(Complete Specification.) F. H. Molesworth. 18,546. November 17.
Stoppers for Liquids under Pressure. E. K. Newton and A. J. Newton. 18,547. November 17.
Superheaters. M. Gehre. 18,549. November 17.
Steam Superheaters. M. Gehre. 18,550. November 17.
Electric Switches. H. J. Pierce. 18,555. November 17.
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Unions for Tubes. L. Skitt. 18,563. November 18.
Dampers for Steam Generator Furnaces. T. O. Bates. 18,568. November 18.
Refrigerating Apparatus. E. J. Hardy. 18,596. November 18.
Cement. T. Arnold. 18,603. November 18.
Compound Gold Wire.—(Complete Specification.) L. L. Burdon. 18,604. November 18.
Compound Hollow Metal Ingots and Wire. L. L. Burdon. 18,605. November 18.
Colouring Matters. H. H. Lake. 18,623. November 18.
Improved Vacuum Chamber. H. H. Lake. 18,624. November 18.
Electric Welding. — (Complete Specification.) H. H. Lake. 18,625. November 18.
Electric Welding. — (Complete Specification.) H. H. Lake. 10,631. November 18.
Concentrating Iron Ore.—(Complete Specification.) R. Haddan. 18,636. November 18
New Anthraquinone Dyestuffs. B. Willcox. 18,637. November 18.
Electric Meters.—(Complete Specification.) E. Hartmann and W. Braun. 18,638. November 18.
Utilising Liquid Fuel for Heat Motors. P. S. Hyslop. 18,639 November 18.
Producing and Storing under Pressure "Combustion" Gases. P. S. Hyslop. 18,640. November 18.
Manufacture of Wine-spirit. A. J. Boult. 18,652. November 18.
Bronzing Alloys. A. J. Spiller. 18,673. November 18.
Manufacture of Oil Gas. E. J. Duff. 18,681. November 19.
Dyeing. J. B. Whiteley, E. Whiteley, A. Armitage, and W. Cleland. 18,700. November 19.
Coating Plates with Tin. D. Jenkins. 18,718. November 19.
Recovery of Tin from Tinned Plate.—(Complete Specification.) M. R. Garcia. 18,726. November 19.
New Derivatives of Anthraquinone. B. Willcox. 18,729. November 19.
Treatment of Phosphate of Lime.—(Complete Specification.) A. Cajot. 18,732. November 19.
Photographic Apparatus. J. W. Hunter. 18,734. November 19.
Preparation of Soap. F. Bryan. 18,748. November 20
Photographic Apparatus. J. E. Thornton. 18,749. November 20.
Continuous Evaporation.—(Complete Specification.) O. Schulz. 18,751. November 20.
Smoke Consumption. R. Cunliffe and E. Barlow. 18,766. November 20.
Use of Granite for Brick Making. J. T. Welch and W. J. Owen. 18,774. November 20.
Manufacture of Soap. C. Billing. 18,801. November 20.
Treatment of Indian Corn for Brewing Purposes. A. E. Favre and G. Savourat. 18,804. November 20.
Charging and Discharging Gas Retorts. J. Staincliffe. 18,825. November 21.
Mechanical Stoker. R. H. Williamson. 18,828. November 21.
Manufacture of Caustic Soda. J. Simpson. 18,835. November 21.
Electric Meters. W. Friese-Greene. 18,836. November 21.
Gas Generating Apparatus. H. Williams, of the Illuminating and Power Gas Co., Ltd. 18,872. November 21.
Subdividing Liquids. J. A. Mays. 18,873. November 21.
Electrolytic Production of Copper Tubes and Sheets.—(Complete Specification.) A. S. Elmore. 18,896. November 21.
Copper Extraction. T. D. Nicholls and the Cape Copper Co., Ltd. 18,898. November 21.
Enriching Phosphated Chalk. L. C. Delahaye. 18,899. November 21.
Electric Switch. E. L. Joseph. 18,913. November 21.
Compound Aluminium Plate.—(Complete Specification.) W. P. Thompson. 18,915. November 21.
Electric Meters. H. Aron. 18,916. November 21.
Plastic Brick-making Machines. W. Stevenson. 18,931. November 22.
Extraction of Metals from Ores. R. Starke and W. Paterson. 18,932. November 22.
Extraction of Metals from Ores. R. Starke and W. Paterson. 18,933. November 22.
Extraction of Metals from Ores. R. Starke and W. Paterson. 18,934. November 22.
Smoke Consumption. W. Sykes. 18,937. November 22.
Manufacture of Soap. J. P. Bayly. 18,965. November 22.
Electric Meters. W. A. Price and W. E. Gray. 18,969. November 22.
Treatment of Sewage. W. E. Adenay. 18,983. November 22.
Chlorine and Caustic Soda. J. Greenwood. 18,990 November 22.
Smokeless Fuel. R. F. Strong. 18,991. November 22.
Brick Kilns. W. Smartt. 18,992. November 22.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending November 22nd.

Antimony Ore—

Spain,	10 t.	J. Pratt & Son
France,	5	H. Emanuel
Ceylon,	290	Cotesworth & Powell
Holland,	20	Vivian, Younger, & Co.
France,	5	T. Trapp & Sons
Portugal,	30	H. Emanuel

Acetic Acid—

France,	36 pks.	Fuerst Bros.
Holland,	194	Rosenberg, Loeme, & Co.
"	50	A. & M. Zimmermann
"	50	Beresford & Co.

Alum—

Holland,	43 pks.	Magee, Taylor, & Co.

Ammonia—

Belgium,	£159.	Weatherley, Mead, & Co.

Alkali—

Holland,	£140.	Taylor, Sommerville, & Co.

Barytes—

Belgium,	45 cks.	O'Hara & Hoar
Holland,	45	Blundell, Spence, & Co.
Germany,	23	W. Harrison & Co.

Barium Chloride—

Germany,	£60.	Petri Bros.

Bromine—

Germany,	£630.	A. & M. Zimmermann

Boracic Acid—

Italy,	20 pks.	W. Nicholson & Co.
"	20	J. Puddy & Co

Brimstone—
Italy, 100 t. Johnson & Hooper
" 3 Typke & King

Bones—
U. States, 18 t. T. A. Lane & Co.
E. Indies, 160 Gonne, Croft, & Co.
Spain, 3 Culverwell, Brooks, & Co.

Copper Ore—
U. States, 22 t. Royal Mail S. P. Co.
Spain, 3 Petty, Wood, & Co.

Cobalt Ore—
Sydney, 105 t L & I. D. Jt. Co.
" 37 c. J. Witt

Cream of Tartar—
France, 27 pks. W. C. Bacon & Co.
Holland, 12 Middleton & Co.
Spain, 11 B. & F. Wf. Co., Ltd.
" 10 C. Christopherson & Co.
Italy, 2 W. C. Bacon & Co.
Spain, 10 B. & F. Wf. Co., Ld.
France, 5 "
Spain, 17 W. C. Bacon & Co.
Holland, 10 Middleton & Co.
France, 16 E. W. Carling & Co.

Caoutchouc—
Singapore, 183 c. Huttenbach & Co.
Penang, 43 Prop. Bull's Wf.
Madagascar, 40 "
Aden, 62 "
Savanilla, 13 "
Tamatave, 67 Hoare, Wilson & Co.
Mauritius, 146 L. & I. D. Jt. Co.
Spain, 31 Stiebel Bros.
Belize, 11 Belize Estate & Prod. Co.
Rangoon, 54 Wallace Bros.
Penang, 30 Props. Butler's Wf.
Singapore, 205 Huttenbach & Co

Chemicals *(otherwise undescribed)*
Holland, 171 pks. J. Barber & Co.
" 15 Phillipps & Graves
Germany, 97 T. H. Lee
" 439 A. & M. Zimmermann
" 72 H. J. Perlbach & Co.
" £55. H. Lambert
" 30 H. J. Perlbach & Co.
" 11 Flageollet & Co.
" 38 T. H. Lee
" 8 "

Dyestuffs—

Extracts
Halifax, 600 cks. A. J. Humphery
Germany, 1 Bartz & Co.
Belgium, 100 L. J. Levinstein & Sons
France, 150 "
U. States, 200 T. R. Ronaldson & Co.
" 63 G. B. Mackereth
Spain, 1 Pickford & Co.
U. States, 10 Williams, Torrey, & Co.

Tanners' Bark
Belgium, 35 t. J. Graves
" 22 Bevington & Sons
" 123 Leach & Co.
Trinidad, 6 Hicks, Nash, & Co.
Port Natal, 13 "
Durban, 6 A. W. Nesbitt

Gambier
Singapore, 182 pks. Beresford & Co.
" 468 Prop. Butler's Wf.
" 459 R. & J. Henderson
" 863 L. & I. D. Jt. Co.
" 1,982 W. H. Cole & Co.
" 419 L. & I. D. Jt. Co.
" 439 J. Swire & Sons
" 223 J. H. & J. Scovell
" 206 D. C. Thomas & Sons

Myrabolams
E. Indies, 683 pks. L. & I. D. Jt. Co.

Indigo
E. Indies, 9 chts. Elkan & Co.
" 91 L. & I. D. Jt. Co.
Holland, 1 Ripley, Roberts, & Co.
E. Indies, 28 L. & I. D. Jt. Co.
" 26 Arbuthnot Latham & Co.
" 11 L. & I. D. Jt. Co.
" 18 "

Sumac
Italy, 500 pks. J. E. Scott
" 100 Hicks, Nash, & Co.
" 500 J. Kitchin, Ltd.

Saffron
Spain, 3 B. & N. Wvs. Co., Limited

Logwood
Belize, 8c t. A. Hagan

Sandal Wood
France, 19 t. Finlay, Campbell, & Co.

Argols
Cape, 58 pks. J. R. Thomson & Co.
Italy, 563 B. Jacob & Sons

Anthracene
Holland, 58 pks. Burt, Boulton & Co.

Orchella
E. Indies, 23 pks. H. Gluck & Co.

Fustic
Spain, 63 t. Churchill & Sim

Cochineal
Canaries, 10 pks. J. Goddard & Co.

Valonia
Smyrna, 50 t A. & W. Nesbitt
A. Turkey, 88 Anning & Cobb
" 50 Hicks, Nash, & Co.

Glucose—
Germany, 200 pks. 200 c. J. Barber & Co.
Holland, 20 180 T. M. Duche & Sons
Germany, 15 120 M. D. Co.
" 150 150 Proprs. Chmblrs. Wf.
U. States, 1,000 1,000 Union Lighterage Co., Ld.
" 100 550 T. M. Duche & Sons
" 1,000 1,000 T. C Howell
" 80 400 P. Windmuller
" 17 102 R. G. Hall & Co.
" 33 260 J. Knill & Co.
" 50 279 Barrett, Tagant & Co.
Germany, 400 400 J. F. Ohlmann
" 10 80 Pillow, Jones Co.

Guano—
Norway, 208 t. J. Jensen & Co.

Gutta Percha—
Singapore, 890 c. H. W. Jewesbury & Co.
" 473 Keltenbach & Schmidt
" 115 J. H. & G. Scovell
" 412 Huttenbach & Co.

Glycerine—
Holland, £570 Langstaff & Co.
Germany, 30 H. Lambert
" 105 Berasford & Co.
Holland, 1,000 Langstaff & Co.
" 450 Spies, Bros. & Co.
Germany, 60 H. Lambert
" 65 Beresford & Co.

Isinglass—
France, 1 pkg. W. M. Smith & Sons
E. Indies, 37 L. & J. D. Jt Co.
" 12 "

Manure—
France, 206 t. Anglo-Contntl. G. Wks.
Germany, 4 F. W. Berk & Co.
" 76 Union Ligtherage Co.
Portugal, 30 G. Bennett & Sons
U. States, 59 C. C. Bryden & Co.
Portugal, 30 G. Bennett & Sons
Belgium, 173 D. de Pass & Co.
Germany, 25 Petri Bros.
Rockhampton 10 L. & I. D. Jt. Co.

Phosphate Rock
B.W.I. 700 t. Pickford & Wrinkfield

Naphtha—
Germany, 10 drs. Lister & Briggs
Holland, 69 Burt, Boulton & Co.
Belgium, 17 Stein Bros.

Nitre—
Germany, 6 cks. Craven & Co.

Potassium Hydrate—
Holland, 4 pks. Spies Bros. & Co.

Potassium Carbonate—
Holland, 16 pks. Spies Bros. & Co

Paraffin Wax—
U. States, 100 brls. E. & H. Halsworth
" 48 cs. H. Hill & Sons
" 150 brls. Mordaunt Bros.

Pitch—
Germany, 46 brls. C. B. Leighton
" 35 "

Plumbago—
Germany, 11 cks. O Scholzig
" 35 Prop. Scott's Wf.
" 2 H. Lambert
" 125 cs. T. H. Lee
E. Indies, 168 brls. Thredder, Son & Co.

Potassium Permanganate—
France, 4 pks. Spies Bros. & Co.

Potassium Muriate—
Germany, 500 pks. Ang. Contntle. G. Wks.

Potashes—
Montreal, 96 c. Charles & Fox

Stearine—
Belgium, 160 bgs. H. Hill & Sons
" 125 "

Saltpetre—
Germany, 6 cks. Craven & Co.
" 42 J. Hall & Sons
" 60 P. Hecker & Co.
" 100 T. Merry & Son
E. Indies, 10 bgs. L. & I. D. Jt. Co.
Germany, 100 P. Hecker & Co.

Sodium Sulphate—
Belgium, £16. W. Balchin

Sodium Prussiate—
Germany, £75. Spies Bros. & Co.

Sugar of Lead—
Germany, 255 pks. Beresford & Co.

Soodium Bicarbonate—
Holland, £90 A. & M. Zimmermann
Germany, 185 c. C. Vincent

Soda Crystals—
Holland, £202. Vokins & Co., Ld

Sodium Acetate—
France, 9 pks. Prop. Hay's W

Turpentine—
U. States, 1,931 brls. Nickoll & Knight

Tartars—
Italy, £650. Howards & Son

Tartaric Acid—
Holland, 4 pks. F. W. Heilgers & Co.

Ultramarine—
Belgium, 4 cks. Leach & Co.
" 11 cs. Henry, Peron & Co.
" 10 cks. Leach & Co.
Holland, 5 brls. Little & Johnson

Verdigris—
France, 6 ptns. Skilbeck Bros.
" 2 J. W. Drysdale & Co.

White Lead—
Germany, 26 pks. Burgoyne, Burbridge & Co.

Zinc Oxide—
Holland, 250 brls. M. Ashly, Ld.
" 50 cks. G. Dards
Germany, 5 pks. J. Dittmer
U. States, 200 brls. M. Ashby, Ld.
Holland, 50 cks. Proprs. of Dowgate Dk.

LIVERPOOL.

Week ending November 25th.

Alcohol—
New York, 5 drs.

Acetic Acid—
Rotterdam, 10 btls.

Ammonia—
Rotterdam, 1,092 bgs.
Montreal, 20 cyls. Molson's Bank

Acetate of Lime—
St. Nazaire, 63 sks.

Bones—
Kurrachee, 4,000 bgs. Ralli Bros.

Bone Meal—
Kurrachee, 1,000 bgs. Ralli Bros.

Bone Ash—
Campana, 447 bgs

Boracic Acid—
Leghorn, 20 cks.

Caoutchouc—
Bayin, 2 bgs. Pickering & Berthoud
" 8 Edwards Bros.
Addah, 2 cks. J. H. Rayner & Co.
" 17 F. & A. Swanzy
" 5 J. P. Werner
" 1 "
Accra, 5 Pickering & Berthoud
" 17 Edwards Bros.
" 11 M. Herschell & Co.
" 8 J. J. Fisher & Co.
" 3 H. B. W. Russell
" 3 C. Lane & Co.
" 2 Davies, Robbins, & Co.
" 2 F. Schaeffer & Co.

Caoutchouc *—continued.*
Salt Pond, 1 cs. 1 cks. Edwards Bros.
" 2 W. Griffiths & Co.
" 2 A. Miller, Bros. & Co.
" 2 W. B. McIve. & Co.
Cape Coast, 13 8 A. Miller, Bros. & Co.
" 8 A. Millerson & Co.
" 1 Heavard & Co.
" 5 W. D. Woodin
" 1 W. Duff & Co.
" 2 C. L. Clare & Co.
" 6 "
Sierra Leone 23 Pickering & Berthoud
" 5 Cie Francaise
" 4 M. Waterhouse & Son
" 2 pks. 7 Paterson, Zachonis, & Co.
" 15 bgs. 13 "
Bathurst, 6 O. Cross & Co.
" 9 Cie Francaise

Copper Ore—
Huelva, 1,400 t. Matheson & Co.
Sestri Levante, 1,008 H. Bath & Sons
Lisbon, 32 t. Harrington & Co.
" 24 cks. Bradshaw, Bros., & Co.
Montreal, 104 brls. Reynolds, Carter & Co

Charcoal—
St. Nazaire 640 sks.

Cream of Tartar—
Barcelona, 10 cks. Ruffer & Sons
Valencia, 2

Dyestuffs—

Saffron
Valencia, 1 cs.

Divi divi
Hamburg, 95 bgs.

Madders
Rotterdam, 2 cks.

Valonia
Constantinople, 77 bgs.
Patras, 218 P. V. Manrachi
" 300 Dem Schinas

Myrabolams
Bombay, 232 bgs.

Argols
Brindisi, 93 bgs.

Cochineal
Goree, 17 bgs. Bruce & White
" 3 Widow, Duranty & Son

Fustic
Corfu, 3 t. P. V. Numicalo

Glucose—
Hamburg, 9 cks.
New York, 75 brls.
Dunkirk, 100 bgs.

Glycerine—
Rotterdam, 1 drm.
Marseilles, 4 R. J. Francis & Co.

Horn Piths—
Lisbon, 5 t.

Horn Tips—
Boston, 32 bgs.

Oxide—
Antwerp, 50 cks.

Potash Salts—
Hamburg, 482 bgs.

Pitch—
Rotterdam, 16 cks.
Dunkirk, 43

Potassium Bicarbonate—
Rotterdam, 10 cks.

Pyrites—
Huelva, 2,039 t. Matheson & Co.
" 1,575 "

Phosphate—
Ghent, 814 bgs. J. T. Fletcher & Co.
" 500 "
Montreal, 292 t. The Phosphate Line Co.
" 150 Millar & Co.
" 109 Ang. Am. Phosphate Co.
" 247 Pickford, Wingfield, & Co.

Potassium Muriate—
Hamburg, 3,639 bgs. J. C. Gamble & Son
Stearine—
Antwerp, 13 bgs.
Saltpetre—
Hamburg, 24 cks.
Soap—
Rotterdam, 2 cs.
Marseilles, 20 Bostock & Co.
" 22
Sugar of Lead—
Rotterdam, 29 cks.
Soapstone—
Genoa, 200 bgs. W. Harrison & Co.
Bordeaux, 800 G. G. Blackwell
Genoa, 250 G. Huntriss & Co.
Tartaric Acid—
Rotterdam, 3 cks.
Ultramarine—
Rotterdam, 8 cks. 3 cs.
Waste Salt—
Hamburg, 280 t.
Zinc Ashes—
Trieste, 9 brls. Hughes, Chenery, & Co.

HULL.

Week ending November 27th.

Acid *(otherwise undescribed)*—
Hamburg, 76 pks. Wilson, Sons, & Co.
Amsterdam, 20 cks. W. & C. L. Ringrose
Barytes—
Antwerp, 50 bgs.
" 54 cks. 100 bgs. Bailey & Leetham
" 40 H. F. Pudsey
Bremen, 23 Tudor & Sons
" 1 J. Pyefinch & Co.
Bone Meal—
Bombay, 700 bgs.
Cream of Tartar—
Rotterdam, 4 cks.
Cellulose—
Hamburg, 408 bgs.
Chemicals *(otherwise undescribed)*
Antwerp, 49 pks. Wilson, Sons, & Co.
Dunkirk, 106 "
Stettin, 20 "
Bremen, 3 crbys. 2 cs. Veltmann & Co.
Dyestuffs—
Alizarine
Rotterdam, 22 pks. W. & C. L. Ringrose
" 25 cks. Hutchinson & Son
" 26 W. & C. L. Ringrose
" 26 cks. Hutchinson & Son
" 25 W. & C. L. Ringrose
" 29 Hutchinson & Son
" 8 pks. W. & C. L. Ringrose
Indigo
Amsterdam, 3 chts. W. & C. L. Ringrose
Naphthaline
Hamburg, 4 cks. Wilson, Sons, & Co.
Glucose—
Stettin, 1,200 bgs. C. M. Lofthouse & Co.
Phosphate—
Ghent, 100 t. Wilson, Sons, & Co.
" 100
Turpentine—
Savannah, 2,000 cks.
Libau, 36
Ultramarine—
Rotterdam, 4 cks.
Waste Salt—
Hamburg, a quantity. C. M Lofthouse & Co.

GLASGOW.

Week ending November 27th.

Borax—
Rouen, 20 cks.
Barytes—
Rotterdam, 222 cks.
Charcoal—
Antwerp, 72 bgs. Brewers Sugar Co.
Dyestuffs—
Madders
Marseilles, 5 brls. Robertson, McIntosh, & Co.
Dyestuffs—*continued.*
Alizarine
Rotterdam, 87 cks.
Glucose—
Philadelphin, 175 brls.
Glycerine—
Bombay, 145 drms. Wallace, Miller, & Co.
Pitch—
Archangel, 100 cks. Stewart, Brown, & Co.
Paraffin Wax—
Philadelphia, 200 brls. H. Hill & Son
" 80
Potash—
Hamburg, 68 cks.
Pyrites—
Seville, 1,400 t. Seville Sulphur & Copper Co., Ltd.
Sodium Silicate—
Rotterdam, 5 cks. J. Rankine & Sons
Saltpetre—
Hamburg, 120 kgs. 12 cks.
Tar—
Archangel, 1,400 bls. Stewart, Brown, & Co.
Waste Salt—
Hamburg, 2,032 bgs.
" 3,048
Zinc Oxide—
Rotterdam, 20 cks.

TYNE.

Week ending November 26th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.
Chemicals *(otherwise undescribed)*
Christiania, 1 cs.
Pyrites—
Huelva, 1,902 t. Scott Bros.
" 3,018 "
Sulphur Precipitate—
Huelva, 153 t. Scott Bros.
Sulphur Ore—
Drontheim, 200 t.

GOOLE.

Week ending November 19th.

Alum—
Rotterdam, 15 cks.
Caoutchouc—
Boulogne, 3 cks.
Dyestuffs—
Alizarine
Rotterdam, 44 cks.
Madders
Rotterdam, 2 cks.
Logwood
Belize, 320 t.
Dyestuffs *(otherwise undescribed)*
Boulogne, 76 cks. 7 cs.
Glycerine—
Rotterdam, 2 drms.
Glucose—
Dunkirk, 170 bgs.
Hamburg, 12 cks.
Muriate—
Rotterdam, 27 cks.
Napthol—
Rotterdam, 3 cks.
Potash—
Dunkirk, 16 cks.
Sugar of Lead—
Hamburg, 19 cks.
Soda—
Rotterdam, 100 bgs.
Saltpetre—
Rotterdam, 200 bgs.
Hamburg, 20 kgs. 36 cks.
Antwerp, 200
Waste Salt—
Hamburg, 690 t. 991 cks. 508 bgs.

GRIMSBY.

Week ending November 22nd.

Chemicals *(otherwise undescribed)*
Hamburg, 13 pks.
Antwerp, 22
Pitch—
Dieppe, 5 cks.
Phosphate—
Montreal, 347 t.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending November 19th.

Ammonium Carbonate—
New York, 135 pks. £565
Hamburg, 4 t. 123
Aniline Oil—
Dunkirk, 6 t. 10 c. 650
Ammonium Sulphate—
Dunkirk, 50 t. 15 c. £560
Hamburg, 50 3 570
Treport, 22 253
Alumina Sulphate
Bordeaux, 10 t. 15 c. £40
Arsenic—
Sydney, 1 t. £15
Acetic Acid—
B. Ayres, 1 t. 14 c. £41
Alum—
Bourgas, 2 t. 12 c. £15
Borax—
Bourgas, 6 c. £8
Hamburg, 1 t. 57
Keppel Bay, 10 cs. 42
Adelaide, 2 1 58
Melbourne, 4 10 225
Bones—
Treport, 20 t. 4 c. £158
Martinique, 275 1,925
Caustic Soda—
Sydney, 20 t. 6 c. £240
Hobart, 10 122
Terneuzen, 10 5 110
Melbourne 10 15 110
Cream of Tartar—
Hobart, 3 c. £17
Melbourne, 10 51
Sydney, 10 50
Dunedin, 10 74
Cooktown, 5 26
Lyttleton, 3 cs. 41 kgs. 63
Melbourne, 5 £29
Brisbane, 2 12
Cream of Tartar—*continued.*
Cossack, 5c. 28
Canterbury, 12 56
Adelaide, 10 50
Citric Acid—
Sydney, 15 c. £100
B. Ayres, 8 cks. 250
Cologne, 2 20
Natal, ½ 4
Hamburg, 3 t. 4 440
Cobalt Oxide—
Genoa, 4 c. £200
Carbolic Acid—
Lyttelton, 96 drs. £43
Hamburg, 1 t. 4 c. 57
Copper Sulphate—
Nelson, 10 c. £12
Melbourne, 12 t. 10 244
Brisbane, 27 5 488
Adelaide, 5 95
Melbourne, 10 180
Bourgas, 13 13
Carbon Bisulphide—
Cape Town, 65 t. 17 c. £867
Copperas—
Bourgas, 5 t. 1 c. £16
Charcoal—
Amsterdam, 25 t. £127
Coal Products—
Dead Oil
New York, 49 t. 4 c. £100
Benzole
Rotterdam, 20 cks. £263
" 29 drs. 490
Treport, 25 rnlts. 220
Rotterdam, 20 pns. 31 drms. 39 cks. 1,357
Aniline
Hong Kong, 1 c. 57
Shanghai, 13 cs. 75
Brisbane, 3 17
Naphthaline
New York, 5 t. 3 c. £72
Le Treport, 4 4 37
Coal Products—*continued*
Pitch
New York, 93 t. 5 c. £189
Alexandria, 15 30
Gijon, 359 512
Seville, 780 1,865
Bourgas, 3 15 10
Varna, 6 17 18
New York, 124 230
Antwerp, 160 252
Oporto, 6 10 16
Nantes, 220 370
Rangoon, 90 brls. 47
Alizarine
Boston, 10 cks. £155
Tar
Ibrail, 25 brls. 14
Melbourne, 100 drs. 24
New York, 3 cks. 142
Kurrachee, 100 brls. 50
Naphtha
Calcutta, 23 cs. £50
Treport, 26 cks. 200
Nitronaphthalene
Stettin, 1 ck. £10
E. London, 400 dms. 18
Toluole
Rotterdam, 9 t. 8 c. £238
Chemicals *(otherwise undescribed)*
Melbourne, 2 t. £34
Christchurch, 10 cs. 47
Lyttelton, 70 pks. 114
Cape Town. 1 cs. 14
Adelaide, 5 23
" 13 c. 26
" 4 19
Melbourne, 2 cs. 15
" 20 cks. 100
Launceston, 8 pks. 18
Melbourne, 21 38
Disinfectants—
Sydney, 7 cs. £83
Cape Town, 1 c. 13
Disinfectants—*continued*
Brisbane, 8 £32
Bombay, 12 t. 125
Cape Town, 66 pks. 110
Algoa Bay, 2 12
Penang, 11 43
Glycerine—
Algoa Bay, 3 pks. £24
Rouen. 17 t. 17 c. 430
Bremerhaven 10 1 55
Cologne, 9 t. 15 250
Guano—
Guadeloupe, 554 t. £5,540
St. Vincent, 150 1,500
Hydro-carbon—
Brussels, 1 t. 10 c. £26
Manure—
Melbourne, 40 t. £540
Sydney, 10 130
Malaga, 21 11 c. 189
Bordeaux, 25 £200
Magnesium Citrate—
Hamburg, 2 t. 10 c. £223
Magnesium Silicate—
Adelaide, 1 t. £7
Phosphorus—
Hiogo, 5 cs. 34
Rangoon, 4 43
Yokohama, 30 300
Monte Video, 4 cs. 30
Phosphate—
Treport, 10 t. £78
Oporto, 21 35
Potassium Cyanide—
New York, 12 c. £96
Madras, 5 cks. 28
Potassium Bicarbonate—
Philadelphia, 17 c. £24
Potassium Bichromate—
Rangoon, 6 c. £9
Potassium Iodide—
Yokohama, 3 cs. £167

Potassium Chlorate—
New York, 100 kgs. £235
Hong Kong, 5 c. £12
Potash—
Bourgas, 5 c £8
Phosphoric Acid
Hamburg, 37 cs. £310
Superphosphate—
Oporto, 26 t. £110
Sodium Bicarbonate—
Canterbury, 2 t. £16
Sheep Dip—
E. London, 25 cs. £70
Cape Town, 229 drs. 202
Wellington, 5 t. 14 c. 198
Dunedin, 5 14 198
Sydney, 50 drs. 27
E. London, 41 pks. 48
Durban, 11 cs. 22
Pt. Elizabeth, 20 40
E. London, 2 t. 108
Saltpetre—
Nelson, 10 c. £12
Melbourne, 2 10 54
" 1 22
Rio de Janeiro, 11 2 252
Cadiz, 2 t. 10 c. 54
Salammoniac—
Yeddah, 1 t. 3 c. 42
Varna, 1 2 37
Sulphuric Acid—
Sydney, 10 cs. £95
Cape Town, 1 t. 10 c. 15
Penang, 1 3 12
Sal Acetosella—
Leghorn, 10 c. £30
Sodium Bisulphate—
Sydney, 21 drs. £14
Soda Ash—
Hobart, 10 t. £95
Oporto, 11 14 27
Salicylic Acid—
Melbourne, 1 c. £25
Sulphur Flowers—
Algoa Bay, 4 t. 9 c. £44
Tartaric Acid—
Canterbury, 5 c. £32
Timaru, 2 15
Hobart, 1 7
Gibraltar, 3 23
Rosario, 100 kgs. 655
Melbourne, 10 69
Dunedin, 5 t. 46
Lyttelton, 3 cs. 20
Brisbane, 2 14
Bombay, 4 33

LIVERPOOL.

Week ending Nov. 22nd.

Alkali—
Genoa, 16 tcs.
Hamburg, 2 cks.
Philadelphia, 25
Ammonium Carbonate—
Barcelona, 1 t. 2 q. £33
Ammonium Muriate—
Philadelphia, 6 t. 10 c. £140
Boston, 3 9 76
San Francisco, 17 12 13
Philadelphia, 6 10 141
Bilbao, 6 10 140
New York, 9 6 210
Alum—
Calcutta, 25 t. 18 c. £157
Baltimore, 24 18 1 q. 281
Santander, 3 16
Vera Cruz, 10 3 7
Rosario, 4 18 26
Boston, 10 3 44
Constantinople, 2 1 6
" 2 18 8
Calcutta, 51 12 154
Ancona, 5 15
Smyrna, 3 9
Madras, 7 10 40
Odessa, 4 18 151
Acids *(otherwise undescribed)*—
Santos, 2 t. 3 c. 1 q. £119
Alum Cake—
Calcutta, 12 t. 1 q. £45
Philadelphia, 5 8 c. 16
Antimony Sulphide
Boston, 18 c. 1 q. £142
Acetic Acid—
Vera Cruz, 2 t. 3 c. 2 q. £33
Albumen—
Vera Cruz, 3 c. £14

Ammonium Sulphate—
Antwerp, 151 t. 7 c. 3 q. £1,830
Rio de Janeiro, 1 12
Barytes Chlorate——
Genoa, 7 c. £26
Bone Waste—
Rouen, 15 c. 5
Brimstone—
Gothenburg, 200 t. 2 c £850
Calcutta, 32 2 2 q. 164
Bleaching Powder—
Amsterdam, 11 cks.
Bordeaux, 78
Boston, 1,071 167 tcs.
Calcutta, 90
Chicago, 50 bxs.
Havre, 12
Philadelphia, 120
Rotterdam, 28
San Sebastian, 17
Genoa, 242
Baltimore, 51
Boston, 192
Calcutta, 8 cs
New York, 253
Boracic Acid—
Genoa, 1 t. 3 c 3 q. £45
Borax—
Santiago de Cata, 4 c. £5
Stockholm, 3 t. 4 87
Rotterdam, 1 11 43
Antwerp, 2 10 3 q. 70
Galatz, 10 2 14
Rotterdam, 17 1 24
Caustic Potash—
Dunedin, 1 t. 1 c. £23
New York, 20 13 445
Sydney, 5 2 108
Cream of Tartar—
St. Johns, 3 c. 1 q. £11
Cobalt Oxide—
Ceara, 4 c. 3 q. £3
Chlorate—
Rio de Janeiro, 6 c. £20
Calcium Chloride—
New York, 10 t. £21
Wellington, 2 10 c. 6
Copper Sulphate—
Valparaiso, 10 t. £200
Genoa, 17 3 c. 299
Venice, 5 12 99
Constantinople, 12 11
Galatz, 10 10
Rouen, 63 4 1,234
Halifax, 8 cks. 36
San Sebastian, 20 3 355
Odessa, 2 19 3 q. 52
Oporto, 1 1 1 19
Ancona, 28 15 3 518
Pernambuco, 15 13
Antwerp, 7 3 127
Bilbao, 14 19 3 256
Genoa, 44 12 3 829
Bordeaux, 176 12 2,201
Bari, 16 2 14
Genoa, 9 14 2 169
Leghorn, 3 17 3 69
Catania, 2 4 1 38
Melbourne, 12 10 275
Montreal, 10 2 1 187
Nantes, 160 8 3 2,965
Odessa, 7 3 145
Syra, 10 1 9
Tampico, 15 2 2 284
Valencia, 12 217
Venice, 95 19 1 1,848
Rotterdam, 5 3 2 93
Bordeaux, 20 4 368
Venice, 29 17 551
Caustic Soda—
Amsterdam, 32 dms.
Seville, 204
Ancona, 20
Antwerp, 40
Barcelona, 240 50 cks.
Bari, 26
Beyrout, 10
Carthagena, 46 pks.
Catania, 40
Genoa, 115
Hiogo, 100
La Guayra, 5
Leghorn, 4
Lisbon, 68
Malaga, 40
Manila, 300
Melbourne, 34 36
Mollendo, 10
Naples, 6
New York, 435
Philadelphia, 100 150 brls.
Havana, 30
Pimental, 10

Caustic Soda—*continued.*
Rotterdam, 25 dms.
Santos, 18
Sydney, 15 bxs. 20 8
Tarragona, 10 cks 49
Trieste, 7
Venice, 71
Adelaide, 124
Ancona, 20
Baltimore, 100
Batoum, 195
Bilbao, 10
Bombay, 10
Bordeaux, 17
Boston, 269
Cape Town, 16
Chicago, 50 bxs. 100
Constantinople, 10
E. London, 60 bxs.
Ferrol, 6
Fiume, 29
Genoa, 157
Gibraltar, 10
Hamburg, 3
Havana, 50
Lisbon, 50
Malta, 6
Melbourne, 30
New Orleans, 25
New York, 723
Odessa, 325
Oporto, 25
Pasages 149
Philadelphia, 50
Port Elizabeth, 45 bxs
Portland, 175
Puerto Cabelo, 15
Rio Grande do Sul, 20 cks.
Rio de Janeiro, 15
Salavery, 40
San Francisco, 375
Santos, 20
Savanilla, 10
Seville, 230 50 brls
Stockholm, 5
Valencia, 2
Venice, 12
Trieste, 48
Carbolic Acid—
Boston, 19 c. 2 q £35
New York, 3 t. 13 3 242
Baltimore, 4 3 237
Hamburg, 5 17 441
Copperas—
Alexandria, 13 t. 18 c. 2 q. £33
Portland, 15 15 35
Piræus, 3 11 1 7
Beyrout, 2 15 2 6
Valparaiso, 3 8 1 7
San Francisco, 17 12 56
Chemicals *(otherwise undescribed)*
Vera Cruz, 1 ck. £7
Galveston, 6 c. 2 q. 6
Disinfectants—
New Orleans, 5 c. 2 q. £19
Calcutta, 6 cs. 20 cks. 42
Rangoon, 10 drs. 13
Rio de Janeiro, 11 33
Bibundi, 3 c. 5
Epsom Salts—
Rio de Janeiro, 30 brls.
Glycerine—
New Orleans, 2 cs. £7
Hamburg, 6 t. 2 c. 148
Guano—
Jersey, 45 t. £360
Gypsum—
New York, 20 t. £60
Lead Nitrate—
Vera Cruz, 4 c. £5
Manure—
Genoa, 19 t. 14 c. £69
New York, 6 15 62
" 1 10 12
Hamburg, 166 318
Monterrat, 5 2 3 q. 28
Magnesium Chloride—
New York, 6 t. 12 c. £17
Oxalic Acid—
New York, 4 t. 19 c. £125
San Francisco, 1 38
Yokohama, 11 1 q. 17
Potassium Prussiate—
Bilbao, 6 c. £27
Genoa, 1 t. 7 3 q. 130
Potassium Bichromate—
Bilbao, 2 t. 19 c. 3 q. £103
Havana, 3 3 8
Hong Kong, 1 15 80
Lisbon, 2 63
Odessa, 12 2 20
Salonica, 1 13 3 50

Potassium Chlorate—
Genoa, 1 t. 10 c. £74
Boston, 2 10 125
Alexandria, 1 50
New York, 5 225
Valparaiso, 8 22
Yokohama, 2 10 185
New York, 5 250
Corunna, 1 46
Havana, 1 15 91
Boston, 2 93
New York, 6 10 303
Hamburg, 17 45
Philadelphia, 5 220
Chicago, 1 5 84
Boston, 7 10 325
Potash—
New York, 10 c. 2 £16
Potassium Carbonate—
New York, 5 t. 16 c. £81
Phosphorus—
B. Ayres, 1 t. 9 c. £150
Sheep Dip—
B. Ayres, 171 t. 17 c. £750
" 60 cs. 300 drs. 230
Portland, 11 t. 5 44
Saltpetre—
Havana, 17 c. 3 q. £20
Manaos, 6 6
Sulphur—
Portland, 441 t. 17 c. £202
Boston, 118 4 600
" 35 2 141
Portland, 91 10 365
" 12 1 q. 5
" 11 9 3 55
Bordeaux, 10 1 41
Portland 25 1 113
Montreal, 2 10 1 14
Boston, 50 2 225
Sodium Sulphate—
Calcutta, 1 t. £23
Dunedin, 3 4 c. 24
Soda Crystals—
Philadelphia, 945 cks.
Boston, 280 brls.
New York, 334
Paraiba, 100
Pernambuco 100
Philadelphia, 748 kgs.
Sodium Bicarbonate—
Hamburg, 100 kgs.
Rotterdam, 25
B. Ayres, 1,250 112 cks.
Dunedin, 175
Genoa, 86
Ghent, 100
Hamburg, 65
Melbourne, 250
Nantes, 4 10 brls.
New York, 250
Odessa, 60
Otago, 60
Oporto, 20
Rotterdam, 30 2
Sydney, 330 4
Sodium Silicate—
Seville, 150 brls.
Bilbao, 20
Genoa, 35 pks.
Gijon, 4
Seville, 150
Soap—
Algoa Bay, 720 bxs.
Amsterdam, 25
Antwerp, 420 cs.
Banoka, 30
Bathurst, 20
Calcutta, 2
Cameroons, 100
Cette, 20
E. London, 606 25 pks.
Ferrol, 20
Gaboon, 153
Gibraltar, 275
Las Palmas, 202
Mayumba, 50
Mpongue, 60
New York, 434
Old Calabar, 1
Para, 100
Port Elizabeth, 300 13 bdls.
Port Natal, 700
Trinidad, 600
Bombay, 20 dms. 194 cs.
Sette Cama, 130
Barbadoes, 200
Bombay, 4
Demerara, 40
Genoa, 100
New York, 59
Portland, 1
Savanilla, 2
Toronto, 200
Valparaiso, 93

Soda Ash—
Ancona, 11 brls.
Baltimore, 283 tcs.
Boston. 120 cks. 860 bgs.
B. Ayres, 120
Buffalo, 60
Dunedin, 5
Havana, 2
Leghorn, 38
Madrid, 86
New York, 1,620 tcs.
Odessa, 164
Philadelphia, 2,236
Sydney, 22
Syra, 35
Adelaide, 129
Ancona, 11
Boston, 447
B. Ayres, 200
Calcutta, 4
Dunedin, 6
Melbourne, 149 pks.
New York, 468 136 tcs.
Oporto, 15 tcs. 10 pps.
Philadelphia, 109 cks.
Rio Grande do Sul, 50 brls.
Smyrna, 309
Sydney, 4
Syra, 100
Tripoli, 30

Salt—
Addah, 12 t.
Bahia, 18 c.
Benin, 28
Boma, 10
Boston, 100
Cabenda, 37
Cape Coast, 6
Cape Town, 25
Copenhagen, 205
E. London, 9
Elobey, 100
Kingston, 5
Loango, 3
Melbourne 200
M. Video, 11
New Orleans, 500 t.
Old Calabar, 150
Opobo, 50
St. Ann's Bay, 5
Saltpond, 6¼
Sierra Leone, 100
Stockholm, 14¾
Sydney, 289¾
Pt. Natal, 143
Adelaide, 185
Baltimore, 103
Cameroons, 20
C. C. Castle, 1 cs.
Demerara, 110
Durbreke, 150
Gr. Bassam, 6
Mauritius, 175
Melbourne, 25
Montreal, 207
Newcastle, 288
New Orleans, 106
New York, 65
Opobo, 50¾
Philadelphia, 25
Portland, 44½
Sherbro', 31 1 c.
Sierra Leone, 55 8
Sydney. 40
Trinidad. 26
Calcutta, 3,135
Rotterdam, 129
Winnebah, 20

Sodium Carbonate—
Boston, 112 bgs.
New York, 140 brls.

Sodium Biborate—
Rotterdam, 1 t. 6 c. 2 q. £40

Sugar of Lead—
Havana, 3 c. 1 q. £5
Calcutta, 10 12
" 1 t. 8 45

Salammoniac—
Alexandria, 2 t. 1 c. 3 q. £73
Fairwater, 6 10
Ibrail, 1 16 1 57
Larnaca, 4 7
Alexandria, 1 33
Genoa, 8 3 15
Alexandria, 9 3 17
Malta, 1 34

Salt Cake—
Baltimore, 38 t. £86

Sodium Nitrate—
Venice, 9 t. 19 c. 2 q. £93
Almeria, 9 3 8
Odessa, 1 3 85
Venice 9 19 2 93

Sodium Chlorate—
Boston, 1 t. 5 c. £78
New York, 1 10 84
" 2 10 148
" 2 10 151
" 1 56
Rotterdam, 15 47

Tar—
Bilbao, 6 cks.
Honolulu, 46 brls.

Tartaric Acid—
Guayaquil, 3 q. £8

GLASGOW.

Week ending November 27th.

Ammonium Sulphate—
Barcelona, 110 t. 5½ c. £1,243

Ammonium Carbonate—
Christiania, 1 ck. £2

Acetate of Lime—
Danzig, 7 t. 1¾ c. £83

Benzole—
Dieppe, 29 pns. 90 brls. £165

Borax—
Rotterdam, 9 cks £17. 10s.
Boston, 13 t 4 c. £374

Bleaching Powder—
Danzig, 63 c. £21

Caustic Soda—
Rouen, 342 c. £138

Dyestuffs—
Logwood
Dunedin. 16 t. 19¾ c. £220
Alizarine
Lisbon, 17 c. £66
Extracts
Halifax, £186

Dyestuffs *(otherwise undescribed)*
Lisbon, 15 t. 14¼ c. £113

Epsom Salts—
Christiania, 50 bgs. £35
Lisbon, 7 t. 4 c. 28

Glucose—
Cape Colony, 9 t. 18 c. 240

Litharge—
Bombay, 1 t. 10½ c. £23
Halifax, 4 9¼ 86

Magnesia—
Barcelona, 11 t. 4¾ c. £183

Manure—
Madras, 5 t. £35
New York 5 52

Naphtha—
Rouen, £450

Oxalic Acid—
Dunedin, 13½ c. £20

Paraffin Wax—
Bombay, 12¾ c. £23
Antwerp, 1 t. 4 37
Dunedin, 2 11½ 66
Nantes, 2 10½ 69
Danzig, 201 1 c. 297

Potassium Bichromate—
Rouen, 1 t. 19 c. £60
" 1.871¼ 2,717
Marseilles, 4 10¾ 150
Barcelona, 73 10¾ 2,378
New York, 505 883
Nantes, 113½ 132
Rotterdam 23 cks. 184
Rouen, 16 3½ c. 515
" 109 1 119
Danzig, 310½ 512

Potassium Prussiate—
New York, 24,640 lbs. £951

Pitch—
Amsterdam, 16 t. £16
Barcelona, 500 13 c. 775
Dieppe, 180 180

Potassium Carbonate—
Bombay, 1 t. £22

Sodium Arsenate—
Lisbon, 38¼ c. £23

Sodium Bichromate—
Rouen, 26 t. 9¾ c. £609
Kurrachee, 1 19¾ £43. 15.
Rouen, 39 t. 8½ 912
New York, 502 644

Soda Ash—
Baltimore, 618¼ c. £19

Sulphur—
Rouen, 200 c. £43

Soap—
Antigu, 629¼ c. £567

TYNE.

Week ending November 26th.

Alkali—
Gothenburg, 8 t. 6 c.
Seville, 5 7
Amsterdam, 22 2
Hamburg, 8 1
Gothenburg, 10 14
Christiania, 1 12

Arsenic—
Barcelona, 1 t. 2 c.

Antimony—
New York, 45 t.

Alum Cake—
Odense, 10

Ammonium Sulphate—
Odense, 5 t.

Alum—
Odense, 5 t. 5 c.

Barium Binoxide—
New York, 19 c.

Barytes Carbonate—
Antwerp, 10 t. 12 c.

Barytes Chlorate—
Hamburg, 8 c.

Bleaching Powder—
Gothenburg, 5 t. 6 c.
Carlshamn, 3 3
Amsterdam, 24 10
Bergen, 4
New York, 75 4
Rotterdam, 17 3
" 10 1
Copenhagen, 1 5
Reval, 100 5
Hamburg, 32 8
" 34 2
Antwerp 20 3

Calcined Magnesia—
New York, 13

Caustic Soda—
Barcelona, 60 t. 5 c.
" 15 2
Huelva, 7
Gothenburg, 11 8
Christiania, 1 3
New York, 20 4
Copenhagen, 4 13

Copperas—
Copenhagen, 21 t. 6 c.

Gypsum—
New York, 73 t. 10 c.

Glycerine—
Rotterdam, 6 t. 13 c.

Litharge—
Hamburg, 1 t. 1 c.
Antwerp, 1 12
Copenhagen, 9

Magnesium Carbonate—
New York, 4 t

Magnesia—
Hamburg, 1 t. 1 c.
Antwerp, 1

Phosphorus—
Malmo, 9 c.

Potassium Chlorate—
Rotterdam, 1 t.

Soda Ash—
Hamburg, 5 t. 9 c
Gothenburg, 56
Christiania, 10 9

Sodium Chlorate—
Hamburg, 5 t.

Soda—
Carlshamn, 11 t. 12 c.
Drontheim, 4 2
" 10 3
" 3 1
Stavanger, 5 7
Huelva, 2 3
Antwerp, 5 3
Christiania, 6 8
Malmo, 25 18
Landskrona, 5 18
New York, 100
Odense, 17 4
" 6 19
Nakskov, 6 11
Svendborg, 8 10
Horsens, 33 9
Copenhagen, 9 7

Sulphur—
Malmo, 21 t.
Rotterdam, 20

Tar—
Riga, 45 t.

HULL.

Week ending November. 25th.

Alkali—
Bergen, 36 cks.
Harlingen, 57
New York, 173
Stettin, 80

Bone Size—
Copenhagen, 2 cks.
Harlingen, 10

Borax—
Odessa, 8 cks.
Stettin, 15

Bleaching Powder—
Bergen, 19 cks.

Caustic Soda—
Genoa, 20 drms.
Libau, 20
Leghorn, 439

Chemicals *(otherwise undescribed)*
Antwerp, 6 cs. 6 cks.
Amsterdam, 1 16
Bergen, 7 12
Copenhagen, 16
Christiania, 30 kgs. 7 8 pks.
Dunkirk, 30
Genoa, 34 cs. 1
Ghent, 4
Gothenburg 9 70 3
Hamburg, 306 79
Konigsberg, 16 35
Leghorn, 8
Marseilles, 10 49
New York, 51 140 100
Norrkoping, 17
Odessa, 278 30
Rotterdam, 2 drms.
Reval, 8
Riga, 3
Stockholm, 53
Stettin, 15 15
St. Michaels, 1

Dyestuffs *(otherwise undescribed)*
Antwerp, 1 cs. 7 cks.
Christiania, 2 124 bgs.
Dunkirk, 10
Hamburg, 27
New York, 3 drms.
Rotterdam, 5 3

Horn Tips—
Rotterdam, 32 bgs.

Pitch—
Genoa, 278 t.
Leghorn, 195

Salt—
St. Michaels, 10 c.

Tar—
Amsterdam, 8 cks.
Hamburg, 5
Christiania, 3

GOOLE.

Week ending November 19th.

Benzole—
Ghent, 16 drms.
Rotterdam, 72 cks.

Coal Products—
Ghent, 1 ck.
Rotterdam, 64

Dyestuffs *(otherwise undescribed)*
Boulogne, 4 cs. 25 cks. 3 drms.
Ghent, 4

Manure—
Antwerp, 500 bgs.
Hamburg, 443

Pitch—
Antwerp, 363 t.

GRIMSBY.

Week ending November 22nd.

Coal Products—
Antwerp, 10 cks.
Dieppe, 105

Chemicals *(otherwise undescribed)*
Dieppe, 11 cks. 9 pks.
Rotterdam, 16 cs.

PRICES CURRENT. WEDNESDAY, DECEMBER 3, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 %, and 40 % .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. ..per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅜
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. ,,	1	15	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	3
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	10	13	9
,, ,, (grey), Hull .. .. ,,	10	12	6
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	5	0
,, Carbonate (native) .. .. ,,	3	10	0
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	6	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	4	7
,, 50/90 ,, ... ,,	0	3	6
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	5¾
,, (crude 60°) .. .. per gallon	0	1	6
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	9
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	15	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	11
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	56	0	0
,, Sulphate .. .. ,,	19	0	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	12	6
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	10	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	17	6
,, ,, (grey) .. .. per ton	13	0	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	3
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	10½
Oils:—			
Cotton-seed .. .. per ton	19	10	0
Linseed .. .. ,,	23	0	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅜
,, American .. .. ,,	0	0	5¾
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	20	0	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. per cwt. £3 5 0 to 3	10	0	
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	0½
,, Nitrate .. .. ,,	0	2	10
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	2	6
,, ,, (Caustic Soda-ash) 48 % . . ,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	10	0
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	16	15	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	12	6
,, ,, (70 % Caustic Soda) ,, .. ,,	11	10	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	10	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	17	6
,, Bicarbonate .. .. ,,	8	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9	0	0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	8	0
,, Nitrite, 98 % .. .. per ton	28	10	0
,, Phosphate .. .. ,,	16	0	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	6	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,	0	0	5¾
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	10	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	27	10	0
Tin (English Ingots) .. .. ,,	95	0	0
,, Crystals .. .. per lb.	0	0	6½
Zinc (Spelter) .. .. per ton.	24	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

THE

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TO ADVERTISERS.

SPECIAL NEW YEAR'S NUMBER OF THE "CHEMICAL TRADE JOURNAL."

In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers.

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

On the occasion of the New Year's Special Number, we shall make use of the whole of the lists we have referred to, numbering altogether, as we have stated not less than 10,000 names.

Of course, for this special issue. there will be special prices for advertisements, but those who order a series, either commencing with that number or previously, will have the advantage of our regular tariff rates, of bringing their specialities under the notice of a very large circle of buyers.

As only a limited number of pages will be added for advertisements, early application for space is necessary. We shall be pleased to send tariff of charges to all those who may desire to advertise in this Special Number.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates:—

30 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

THE ADULTERATION OF COAL.

"FRAUDULENTLY increasing weight or bulk." These are the words usually attached to an indictment for adulterating the different articles of retail trade, which have furnished occupation for inspectors, police, and magistrates, under the provisions of the Adulteration Act. We do not believe that the Adulteration Act covers coal, or was intended to cover it, but we emphatically say that a large amount of trickery is going on among retail coal dealers, to the disadvantage of small consumers, among which, many of our *clientèle* are to be found as small chemical traders. Since the strikes, which have, within the last two years, enhanced the price of coals, we have received a large number of samples of coal purchased by small manufacturers and house-holders, for our examination and opinion, and we are enabled to speak with some authority upon this subject,—the authority based upon knowledge and experience.

When we consider that some thirty millions of tons of coal are used annually for domestic purposes alone in this country, and when we consider further, that out of some twenty millions of tons used for steam raising, a considerable proportion, to say the least of it, must be put down to small consumers who cannot protect themselves; the subject is obviously one of great importance. We have purposely left out large consumers, such as Gas Works, Iron Works, etc., as these are usually protected by contract as to quality, source, and price, and in some cases, own their own collieries, and are therefore outside our argument.

The coals supplied to small consumers sometimes contain, especially when sold by the hundred-weight to the poor, twenty (and in one case that we know of, twenty-seven) per cent. of ash. Ask the dealer what coal he is selling, and he will say, it is such and such a Silkstone, or such and such a top or bottom seam. While writing, we recall one instance of a dealer who stated that a particular coal in question was from a certain seam of a certain colliery, which we know to produce a small quantity (under four per cent.) of a red ash, whereas the coal supplied, contained nineteen per cent of a white ash.

The ash and moisture in coal are very important elements in relation to its usefulness, and especially the ash, which, instead of having a calorific value of its own, has exactly the opposite, namely, the power of absorbing so much of the heat emitted by the combustible portion as corresponds to the weight of ash and its specific heat. It is self evident that the number of substances which can be used to adulterate coal is limited, and that the most probable and as a matter of fact the most common are those worthless substances such as shales and "brasses," which are met with in winning the coal itself. Shale is not coal, "brasses" are not coal, and to mix these in undue proportion with coal sold as fuel, is adulteration just as much as the addition of water to milk, of alum to bread, of chicory to coffee, of mineral substances to annatto, or of barley to oatmeal, and in our opinion it ought to be made a legal offence just as much as are these other additions. We have taken pieces of good shiny coal out of

a load and found them to contain one and a half per cent. of ash. We have taken shovelfuls out of the load, crushed them to a fair sample, and found them to contain twenty-three per cent., principally owing to shales and "brasses," the latter being a synonym for pyritiferous matters, or sulphides of iron.

In discussing the smoke question it is often urged that to get rid of black smoke is less easy than to get rid of the invisible sulphurous acid. True, but one of the best ways of getting rid of the invisible, but highly injurious sulphurous acid is to exclude the source thereof as far as possible from the fuel. A maxim in vitriol making is that if you do not burn sulphur you get no acid, and it is on all fours to say that the less sulphur there is in the fuel, the less sulphurous acid is in the smoke. The reduction of ash, of shaly and pyritiferous matters in coal is an object worthy the united efforts of the whole community.

SMOKELESS POWDER.

FROM the following interesting report of Krupp even laymen can form a judgment as to the high value of the smokeless powder. The report reads as follows:—

Much as has been written so far about the effects of the new powder, no side has touched upon the composition of its chemical component parts.—A much wished-for light is thrown on this composition for the first time by the trial-shooting report of Krupp. We have taken from it, says *Kuhlow*, the following, which is of general interest: for all new kinds of powder nitrited cotton forms the basis. If cotton is treated with nitric acid and sulphuric acid, then, according to the strength of the acid and the methods employed, three kinds of nitrated cotton arise:—

	Trinitro-Cellulose.	Binitro-Cellulose.	Mononitro-Cellulose.	Cellulose.
Carbon.....	24,24	28,57	34,80	44,45
Hydrogen....	2,36	3,18	4,34	6,17
Oxygen.....	59,26	57,14	54,10	49,38
Nitrogen	14,14	11,11	6,76	—
	100,00	100,00	100,00	100,00

So far it has not always been possible for one to prepare with certainty the one or the other combination of nitrogen, mentioned above. On the contrary, the different combinations are always found to be mixed. If trino-cellulose preponderates, the product is called gun-cotton; if binitro-cellulose preponderates, we get collodion wool.—Gun-cotton is only soluble in acetone, collodion wool only in spirit of wine and nitro-glycerine. This latter property has been utilised by Herr Alfred Nobel, the inventor of the dynamite, to manufacture a new powder for guns and cannons. The gun-powder proposed by Nobel is made of equal parts of collodion wool and nitro-glycerine. The preparation is made in the following manner: at a temperature of +6-8° C. one part of collodion wool is put into 6-8 parts of nitro-glycerine. The whole is taken into a place, which can be made void of air, so that the nitro-glycerine can come into the closest contact with the wool, then the nitroglycerine substance is—as far as it is necessary for the intended mixing proportion—pressed out under a press or in a centrifugal pump.—The cake which is gained by this flinging out or pressing is broken into pieces, exposed to a temperature of 60-90° C., in which the nitro-glycerine dissolves the collodion wool. Then the mass is rolled, under the same high temperature, into thin plates. These thin plates are pressed into thicker ones under a roller. The product thus gained must be perfectly homogeneous and evenly translucent in all parts. The thickness of the plates depends on the largeness of the required powder. The powder is used in the form of dice or in that of plates. To secure the stability of this powder one may add to the glycerine at the beginning 1-2 per cent. diphenylamine. So much about the old manufacture.

The new chemical formula would be:

$$10C_3H_5(ONO_2)+9C_6H_7O_2OH(ONO_2)_2$$

with a molecular weight of 4,538. The decomposed products would therefore be:

$$58CO+26CO_2+61H_2O+48N$$

and all gaseous. The powder can be styled therefore smokeless, because the small amount of ash, which the wool contains, remains unnoticed. The products of combustion become visible by the steam being condensed, when leaving the inside of the gun, and the nitrogen entering into a chemical combination with the oxygen of the air. What we see, during the firing, is therefore not powder smoke but powder steam, which disappears quickly if the charge is small. The powder has a density of 1·6, its colour is yellowish, it feels to the touch like elastic and can be easily cut with a knife; it is not sensitive to moisture, and less sensitive to changes of temperature than the old powder; to warmth it is rather more so. That it is not advisable to keep powder at a temperature of more than 50°C. experiences with the black powder have shown. All the statements made here, have been laid down by Krupp after a number of the minutest trials, and they are all indubitably true. We may only add, that this firm had used for one year and a quarter smokeless powder for all calibres.

MAGNESIA IN PORTLAND CEMENT.

NOT long ago the failure of certain important sea work caused an outcry against a substance possessing a very white and innocent appearance—magnesia. Engineers, not unreasonably alarmed by the dreadful accounts of the mischief it had wrought which were freely circulated, preached against it a war of extermination. The unfortunate cement maker in many cases, blissfully ignorant of magnesia save in relation to the ailments of childhood, was driven well nigh desperate by sudden and imperious demands for the minimum possible percentage of the accursed thing. The *Engineer*, from which we quote, says:—"The aid of the chemist, sometimes it is to be feared equipped with such knowledge as may be gleaned by a hasty perusal of the article 'Cement' in a technological dictionary, was invoked and led to fresh confusion. Analyses were made of the fresh cement, of briquettes set in water and air, of the 'white stuff' that sometimes appears on them, of deposits on concrete blocks exposed to the action of sea water, and constantly with the result that the dreaded oxide was again detected. Like most errors of any vitality, this particular delusion contained an element of truth. No one having even a superficial knowledge of the subject would deny that dolomite should at least be used with caution in the manufacture of cement, but the lengths to which the magnesia crusade was carried afforded food for mirth to the *cognoscenti*. Thanks to the persistent good sense of some who did not yield to the general panic there are symptoms that the tide has turned, and restoration to sanity is imminent, even in cases at one time reckoned hopeless. At this juncture it will be well to try the remedial action of a few cold facts. The direct experimental method has much to recommend it, and the figures recently obtained by Dyckerhoff are worthy of the closest attention.

This experimenter, whose original paper may be found in a recent number of the *Thonid Zeit.*, investigated a series of cements with a content of magnesia ranging from 1·9 to 21·24 per cent. It is most noteworthy that the former figure—the very lowest which is reckoned as characteristic of a normal cement, that proved faultless when critically examined—is nearly double the maximum fixed by some cement users on this side of the North Sea. That fact needs no comment, but its proper digestion may possibly restore the confidence which English specialists of the better sort have vainly tried to instil. A condition of the utmost weight, and too often overlooked in researches of the kind, was in this case scrupulously complied with; ample time was allowed for the development of latent defects, the experiments extending over two years. All the cements dealt with increased in strength up to the end of six months, although those containing most magnesia were weaker than the others. The three containing the largest proportion of magnesia, viz., 10·82, 17·80, and 21·24 per cent. respectively, began at this point to retrograde rapidly. Two other specimens, containing 6·23 and 11·36 per cent., increased in tensile strength up to twelve months, and then gave evidence of retrogression. It was also proved that the temperature at which the cement had been burned was of considerable influence, lightly-burned cements growing weaker sooner than those made from well-burned clinker. This is in no way surprising, for it is a well-known chemical fact that the exposure of magnesia to a very high temperature renders it almost inert, or, to speak more exactly, slower in its reaction with water, the product slaking very gradully, and remaining caustic for a considerable period. Magnesia, then, in this condition would not hydrate either at the time of setting or long afterwards, and would only do so and thereby expand with destructive force long after the work in which it was employed was finished past remedy.

To sum up, then, it is plain that magnesia in tangible amount, *i.e.*, over 5 per cent., is distinctly dangerous, and cement containing such a proportion should be rejected without appeal; but the moderate quantities found in ordinary Thames or Medway cements of good quality—almost invariably nearer 1 than 2 per cent.—are thoroughly innocuous, and rejection based on their presence is capricious, vexatious, and in the highest degree unreasonable. Proper watch by means of analysis on the quality of cement in this particular and unbiassed specialist judgment will prevent needless alarms and disastrous failures.

MANGANESE ORE IN THE CAUCASIAN MOUNTAINS.

MANGANESE has been found in places lying on both shores of the "Quirila," in the vicinity of Tschiatura. In the localities this ore appears in 6 to 11 layers, changing with or alternating with a rotten tertiary sandstone. Together, these layers form a vein of from 2 to 3 feet in thickness. This ore is in round numbers 55 per cent. metallic manganese. It contains quite a percentage of phosphorus (0·15 to 0·20 per cent. and frequently even more) and contains 1·679 to 6·67 per cent. silicic acid. The operations in connection with the gathering of this ore have, until now, been of an irregular and broken nature conducted by a large number (in 1888 there were 86) of small firms. Caucasian manganese ore remains an article only of export for Russia, at present, and the very large increase of export indicates a powerful and growing inquiry on the part of the foreign chemical and metallurgical industries.—*Translated from "Der Zeitschrift fur Angewandte Chemie."*

The entire export of Caucasian manganese ore is by way of Poti.

The following quantities have been exported from Poti since, 1882, viz :

	Pood. (35 lb. avoir.)
1882	562,720
1883	871,504
1884	1,247,841
1885	2,198,809
1886	3,403,426
1887	3,690,440
1888	3,043,615

During the *current* year, it is expected the export will amount to 6,000,000 pud.

At present, manganese ore is being sold at the place of mining at 5 to 6 kop per pud. Freight to Poti from the place ofobtaining this ore costs about 34 kop. per pud.

DYEING BRONZE AND BROWN.

THE practical dyer, says Dr. Reimann's *Faerber Zeitung*, knows that the formulæ for dyeing bronze and brown have recently been increased to an unlimited number, by the invention of the direct dyeing pigments, as well as by the alizarine dyestuffs. For the present, however, a few of the older methods of dyeing will be mentioned, or, in other words, those methods where camwood, caliatura, or young fustic and camwood are used. The colours obtained with the latter are excellent for fine yarns, because they are very fast against fulling, bleed almost nothing at all, and wear well. They are generally used for brown by previously mordanting. The colour not only becomes brighter by this process, but its power of resistance is equally increased. The following is an excellent, although a somewhat costly, recipe :—For 100 kilogrammes clean wool, mordant, boiling with 2½ kilogrammes chromate of potash, 1¼ kilogramme sulphate of copper, and 2 kilogrammes tartar. Dye with 60 kilogrammes cuba fustic, 50 kilogrammes camwood, and ½ to 1 kilogramme logwood. When the wool has been boiled for two hours, and handled well, pour upon it from 1 to 1½ kilogramme sulphate of iron, largely diluted, and boil for another hour. Cool the kettle well, and take out. Care is necessary that the wool, which is boiled with large quantities of ground dyewoods, should be boiled somewhat longer, but not too hard, and that all additions of cold water during the boiling must be avoided. When boiled sufficiently, cool off well. Brown colours dyed with ground dyewoods are apt to make the wool harsh, brittle, and inclined to felt. Rinse such colours carefully, dry the wool in medium hot chambers, and pass through the whipper. The palest and the darkest shades, as well as yellowish or reddish tones, may be dyed according to this method. The next method is much cheaper, and is as follows :—For 100 kilogrammes clean wool, mordant, boiling, with 2½ kilogrammes chromate of potash, 1½ kilogramme sulphuric acid, and dye with 45 kilogrammes fustic, 3 kilogrammes turmeric, 50 kilogrammes caliatura, and 1 kilogramme logwood. After boiling for two hours, sadden with 1¼ kilogramme sulphate of iron, and continue boiling for another hour. Colours not as bright are obtained without mordanting. They are more suitable for cheaper grades of goods, or for backing. For 100 kilogrammes clean wool, boil with 30 kilogrammes fustic, 5 kilogrammes turmeric, 2½ to 5 kilogrammes logwood, 32½ kilogrammes sanderswood, and 5 kilogrammes sumac. Sadden with 6 kilogrammes sulphate of iron. After boiling for 1½ hour, pour over the wool two buckets of urine, and let it lie for several hours.

Fairly bright colours are obtained with young fustic and camwood, and although they may not be quite as fast, they leave the wool soft and open. For 100 kilogrammes wool, mordant, boiling, with 2½ kilogrammes chromate of potash, 1¼ kilogramme sulphate of copper, 1½ kilogramme tartar. Dye with 70 kilogrammes young fustic and 25 kilogrammes camwood ; sadden with 2 kilogrammes sulphate of iron, and from ½ to 2½ kilogrammes logwood. A fast, but not very bright, brown is produced by mordanting, boiling, with chromate of potash and sulphuric acid, and dyeing with fustic, camwood, and logwood. Sadden with sulphate of iron. Wool to be dyed a cherry brown which must not be boiled too sharply, and cooled well before taking out the wool, in order to preserve this in a condition to be spun, is not mordanted, but boiled for two hours in a bath (for 100 kilogrammes wool) with 75 kilogrammes caliatura, 2 kilogrammes logwood, 4 kilogrammes fustic, 1½ kilogramme tartar ; and darkened with 1½ kilogramme sulphate of iron. A cherry brown, which resists fulling well, and which gives very good results in combination with white, is produced as follows :—Mordant 100 kilogrammes clean wool with 3 kilogrammes chromate of potash, and 2½ kilogrammes tartar, and leave the wool in it for one day. Boil 100 kilogrammes camwood, cool off with water, enter the wool, and boil gently for three hours. the solution of ¼ kilogramme sulphate of iron then carefully sprinkle over, continue to boil for another 1½ hour, cool off, and pour ¼ kilogramme crude hydrochloric acid, diluted in 60 litres (63⅜ quarts) water, upon the wool, which is then left to lie for 30 minutes. Mulberry is produced in a manner similar to cherry brown :—100 kilogrammes clean wool are boiled with 15 kilogrammes logwood, 50 kilogrammes caliatura, and 1 kilogramme tartar. Sadden with 5 kilogrammes sulphate of iron. Red-brown colours are often dyed with camwood. It is well known, however, that these colours, although brighter, and leaving the wool softer and more open, are more fugitive than those produced in the manner indicated above. Cherry brown, also called Bordeaux, is dyed as follows :—For 100 kilogrammes clean wool, start the kettle with 12½ kilogrammes alum, mordant with 1½ kilogrammes chromate of potash, and 3 kilogrammes tartar. Leave the wool immersed for one day, take out, rinse, and dye with 100 kilogrammes camwood, 12½ kilogrammes fustic, and 3 kilogrammes logwood. Boil the wool for one hour, and darken with 3 kilogrammes sulphate of copper. The wool is ready after boiling for 1½ hours. When dyeing to sample, the colour must always be kept two degrees lighter than is required, as it darkens considerably afterwards.

VOLUMETRIC DETERMINATION OF TANNIN.

By E. Guenez.

THE method of the author is based upon the following observations, viz. :—1st. If a solution of tannin is added to a boiling solution of tartar emetic mixed with a suitable aniline dyestuff, antimonic tannate is precipitated, which carries the dyestuff along with itself, forming a true colour-lake. If a sufficient quantity of tannin is present, the liquid is completely decolourised. The tartar emetic must be present in excess as regards the dyestuff. 2nd. The volume of coloured solution of tartar emetic is always proportional to that of the solution of tannin necessary to produce decolouration. Dilution does not influence the results. 3rd. A determined quantity of antimonic tannin always combines the same quantity of dyestuffs. 4th. When a solution of gallic acid is poured into a boiling solution of tartar emetic the precipitate of antimonic gallotannate is not immediately formed, while the antimonic tannate is produced instantaneously. The result of the determination is not influenced by the presence of gallic acid.

After the author's method, a solution is prepared of 12 grms. tartar emetic, 1 grm. Poirrier green, 4 JE, and 1 litre water, by dissolving the tartar and the dyestuff separately, mixing the solutions, and filtering. This dyestuff gives excellent results. The solution is titrated upon an etheric solution of perfectly pure tannin which has been dried in the vacuum over sulphuric acid : 5-6 grms. of it are taken per litre, and, in order to prevent the formation of mould, a small quantity of alcoholic solution of thymol is added. Then 20 ccm. of the coloured solution of tartar emetic are measured into a glass tube of 35 mm. diameter, the same volume of water added, heated to boil, and the tannin solution introduced from a burette with cock until complete decolouration is obtained, always bringing again to boil after every addition. The green flocculent precipitate is easy to separate.

The method is particularly applicable for the examination of extracts of tannic acid. But as they do not contain the nutgall tannin, in the result the quantity of tannin acid contained in an extract is expressed by the equivalent weight of gallotannin, as is the case in all volumetric methods ?

The method allows of rapid operation, gives altogether comparable results, and presents the advantage, that the latter are not influenced by the presence of gallic acid. It cannot be employed for the determination of tannic acid in wines, for which purpose A. Girard's elegant method always gives the best results.—*Chem. Ztg.*

ARTIFICIAL ALIZARINE.

ROMEN proposes that artificial alizarine, instead of being sold as a paste or liquid containing 80 or 90 per cent. water, should be offered on the market in the dry state as a 100 per cent. alizarine, instead of the 10 or 20 per cent. product of the present day. It is well understood that the reason why alizarine is not dried by the makers, is because if once dried it is practically impossible to reduce it again to a uniform state of hydration, and as it is but very little soluble in water, there would be both waste and irregularity in using it for dyeing or printing. This, however, is to be obviated, according to Romen's patent, by dissolving the dry alizarine in alkali and precipitating again by acid shortly before use. For example, taking 100 kgs. of goods to be dyed, 2,000 litres of water are required, and say 2 kgs. of 100 per cent. alizarine; this latter is mixed up with 15 to 20 litres of hot water, to which is added 1,300 cc. of caustic soda at 38° and 300 grms. borax; the alizarine is dissolved and in this state added to the water in the dyeing vessel; then is added 1,300 cc. hydrochloric acid sp. gr. 1·15 and 400 cc. acetic acid, the goods entered and the dyeing proceeded with; for printers' purposes less water is to be employed. The advantages claimed are easier and cheaper carriage, and the much finer state of division of the alizarine than exists in the commercial pastes. The disadvantages do not need stating.

POTASH FERTILIZERS FOR CEREALS.

THE different salts of potassium have not exactly the same action in different soils and on different plants. The following rules will serve to show how they should be employed.

NATURAL PRODUCTS.

KAINITE.—This is the raw material from the mines, simply reduced to powder to facilitate its uniform dispersion over the land. It contains its potash in the form of sulphate and chloride mixed with chlorides of sodium and magnesium. These salts of sodium and magnesium which accompany the potassium salts, are of great importance as disintegrators of the constituents of the soil. Such crude material should not be used in the cultivation of tobacco, because the presence of chlorides diminishes the combustibility and consequently the quality and value of he leaf.

Kainite is very valuable for light sandy soils, and also for turfy land. It has a tendency to keep the soil moist and to render it more compact. Although this property is of value in light sandy soils, it is, of course, disadvantageous in heavy clayey land, for which the manufactured products should accordingly be used.

Kainite is advantageous for all kinds of crops, especially cereals, potatoes, beetroot, cabbages, peas, beans, clover, etc. In the case of flax and hemp it not only produces a more abundant crop, but also a superior fibre.

The quantity to be applied depends of course upon the nature of the soil; it may be taken as a general rule that the proper quantity varies between 400-800 kilos per hectare.

Low lying, peaty land requires at least 800 kilos. per hectare, which should always be applied in autumn, whatever the nature of the soil. For potatoes and sugar beets, which require much potash, kainite should be laid down at the harvest and an additional quantity put down at the commencement of autumn. It is always necessary to well cover the kainite with earth, as otherwise the potassium salts remain at the surface and do not easily penetrate to the lower roots of the plants. Excellent results are also produced in meadows and fields of clover. The application of 400-600 kilos., along with 300-500 kilos. of superphosphate per hectare, will improve the crop both in quantity and quality. The effect is most marked when this mixture is used on damp fields, suitably drained, lime being added if necessary. Weeds soon disappear and are replaced by herbs and plants, which are at once more nourishing and better liked by cattle. Kainite is also to be recommended as a means of preserving the nitrogen and humus substances in dung manure. The nitrogen is preserved by the action of the magnesium salts, whereas it would otherwise escape in the form of ammonia and be completely lost.

CARNALLITE.—This is the chief source of the manufactured salts of potassium. It is not imported into France for use as a fertilizer.

KIESERITE AND SYLVINITE.—Kieserite and sylvinite have been quite recently introduced. They are valuable, not only as potash fertilizers, but also as preservers of nitrogen. Sylvinite is richer in potash than kainite, whereas kieserite contains less than this. The mode of application and the effects produced are analogous to those of kainite.

PRODUCTS MANUFACTURED AT THE STASFURT WORKS.

CONCENTRATED POTASSIUM SALTS.—These salts are four or five times as rich in potash as the raw products. They render it possible to effect a considerable economy in transport expenses, and where only potash is required they should be preferred to the raw products.

SULPHATES OF POTASSIUM.—In heavy soils sulphates should be employed. They are better suited for tobacco on account of the absence of chlorides, and are also more suitable for the production of sugar and starch in plants, such as the sugar beet, the potato and cane sugar. 200-400 kilos. per hectare is a sufficient application for most soils. They should be laid down in autumn or winter and well worked into the soil.

SULPHATE OF POTASSIUM AND MAGNESIUM.—This salt produces analogous effects to the simple sulphate. It is also very valuable for the preservation of manure and is moreover free from chlorides.

Manure treated with this salt is an excellent fertilizer for tobacco. It is also good for mixing with other salts, as it advantageously modifies their physical properties and renders them better adapted for being spread on the fields. About 300-700 kilos. per hectare should be employed.

CALCINED KIESERITE.—This salt is valuable for its magnesia, which acts as a solvent and as a preservative for manure.

CHLORIDE OF POTASSIUM.—This is the richest and most soluble salt of potassium. It can be used with all crops except tobacco, and is excellent for cereals, colza, peas, beans, beets, asparagus, cabbages, etc. It should be applied in autumn to the extent of 250-450 kilos. per hectare. It cannot be employed for preserving manure.

CALCINED SALTS OF POTASSIUM, POTASH SALTS, AND FERTILIZING SALT.—These are similar to kainite in composition and in their effect on plants and are employed in the same manner. As they are, however, richer in potassium than kainite, they can be used in smaller quantities. The correct amount is about 300-600 kilos. per hectare with the low quality (15%) and 225-500 kilos. with the better quality (20%). They are valuable preservatives of manure, the low quality being the better for this purpose.

POTASSIUM SALTS PRODUCED IN FRANCE.

Although Germany, with its natural deposits at Strasfurt, has to a certain extent monopolized the production of potassium salts, and exports large quantities of potash manures to all the countries of Europe and even to America, France also produces concentrated potash salts, which can compete with the corresponding German products alike in quality and price.

We have previously given long details concerning the French manufacture of potassium salts, and will at present only refer to the industries which produce them.

SALT REFINERIES.—The beetroot absorbs potassium salts from the soil and those are found in the residual molasses of the sugar extraction. These molasses yield, on distillation, alcohol, and vinasse containing the potassium, and sodium salts absorbed by the root. The salts and crude potashes are obtained by the evaporation of this vinasse, and the refining of these crude salts, carried out in a few works in the region of Le Nord, produces:

Potassium carbonate of various strengths.
Sodium " " "
Potassium Sulphate 90-95%
Potassium Chloride containing 90% of potassium salts.

POTASH FROM SUINT.—Raw wool contains potash, which is removed by the water used to wash the wool before submitting it to combing, etc., at Roubaix, Tourcoing, and Rheims. The first wash waters are evaporated, and the residues calcined. In this way is obtained:

Potassium carbonate from suint, a very pure product, containing no more than 2-3% of sodium.

POTASSIUM SALTS FROM THE SEA.—Sea water contains small quantities of potassium salts, which frequently become concentrated in the bitter waters of salt marshes. Salts of potassium and magnesium have, for some time past been extracted from these waters by the Balard process. This industry, as regards the potassium, has not been able to compete with the German mines. In l'Ouest, certain industries treat the ashes of seaweed for salts of sodium, potassium, and iodine. A small amount of potassium chloride is thus annually produced in Brittany.

POTASSIUM NITRATE OR SALTPETRE.—A solution of potassium chloride mixed with one of sodium nitrate in proper proportions yields, on evaporation, potassium nitrate and sodium chloride. Saltpetre is mainly employed for the manufacture of gunpowder. Notwithstanding this, as saltpetre contains 45 to 50% of pure potash and 13% of nitrogen, it is used in small quantities for agricultural purposes, in spite of its high price. Considerable amounts of natural saltpetre are sent to France from India for this purpose.

POTASSIUM SILICATE.—This is the last of the potassium compounds which can be made use of in agriculture. Potassium silicate represents the original form of all the potassium salts present in the soil. The soil itself is produced by the gradual disintegration of the rocks, made up for the most part of complex silicates, among which potassium silicate is very largely represented. These substances are themselves insoluble, but gradually become soluble in the soil by the chemical and physical changes through which they pass.

Felspar, for example, has the following average composition :—

Silica	65 per cent.
Alumina	19 ,,
Potash	11 ,,
Soda	1-2 ,,
Lime	0-1 ,,
Magnesia	0-0·2 ,,

The granites are of very variable composition, but all contain potassium in the form of silicate.

The following table gives their mean composition (Muntz and Girard) :—

	Silica.	Alumina.	Potash.	Soda.	Lime.	Magnesia.	Phosphoric Acid.
Granite rich in potassium	70·0	17·0	6·0	2·0	0·5	0·5	0·1
Granite rich in sodium	70·0	17·0	4·0	4·0	0·5	0·5	0·1
Granite containing lime	70·0	17·0	6·0	2·0	1·5	1·0	0·2
Gneiss	65·0	22·0	3·5	2·0	0·5	0·5	0·2
Schists and Micaceous Schists	60·0	30·0	5·0	5·0	—	—	—
	73·0	13·0	6·0	—	0·2	2·5	—
Porphyry	65·0	15·0	5·0	2·0	1·0	1·5	—

All these silicates of potassium are insoluble, and only give up their potassium to the plants after numerous transformations carried out during a very long period in the soil. It was therefore quite natural to imagine that artificially prepared silicates, much more soluble than those of the rocks, would make an excellent potash fertilizer. Experiments on these lines were made some years ago, but the question has not been sufficiently well studied for anyone to pronounce decidedly in favour of or against the use of potassium silicate as a manure.—*Maizières.*

COMPOSITION OF POTASSIUM SALTS.

Analyses of the Raw Materials and Manufactured Articles from German Works.

	Potassium Sulphate.	Potassium Chloride.	Magnesium Sulphate	Magnesium Chloride	Sodium Chloride.	Calcium Sulphate.	Insoluble in Water.	Water.	Pure Potash.	Salts which neutralize Ammonia.
A. Natural Products—										
Kainite	23·3	2	14·5	12·4	34·6	1·7	0·8	12·7	12·8	28·6
Carnallite	—	15·5	12·1	21·5	22·4	1·9	0·5	26·1	9·8	35·5
Kieserite	—	11·8	21·5	17·2	26·7	0·8	1·3	20·7	7·5	39·5
Sylvine.. *a*	7·1	24·7	5·8	4·0	46·2	1·9	1·9	8·4	19·4	11·7
b	17·2	11·1	11·8	8·1	38·2	3·6	0·3	9·7	16·3	23·5
c	16·3	14·0	11·8	9·3	34·9	3·6	1·8	8·3	17·6	34·7
B. Manufactured Products—										
(*a*) Sulphates of Potassium—										
1. Sulphate of high quality, 96%	97·2	0·3	0·7	0·4	0·2	0·3	0·2	0·7	52·7	—
2. Sulphate of high quality, 90%	90·6	1·6	2·7	1·0	1·2	0·4	0·3	2·2	49·9	—
3. Double sulphate of Potassium and Magnesium (Double salt fertilizer)	50·4	—	34·0	—	2·5	0·9	0·6	11·6	27·2	34·9
4. Calcined Kieserite	—	—	65·8	—	0·9	6·5	15·7	11·1	—	72·3
(*b*) Chlorides of Potassium—										
90/95%	—	91·7	0·2	0·2	7·1	—	0·2	0·6	57·9	—
80/85%	—	83·5	0·4	0·3	14·5	—	0·2	1·1	52·7	—
70/75%	1·7	72·5	0·8	0·6	21·2	0·2	0·5	2·5	46·7	—
Calcined Potash Salts for Fertilizers—										
High quality	—	44·5	22·5	4·6	12·4	2·9	5·3	7·8	28·1	30·0
Low quality	—	25·6	31·1	6·3	10·3	3·5	10·6	12·6	16·2	40·6

THE ANALYSIS OF FATS.

THE exact determination of glycerine in fats has been, up to a very short time ago, a difficult operation—so much so, that it could only be determined approximately. The elegant method of Zsigmondy and Benedikt, although permitting a higher grade of accuracy, leaves some uncertainty as to impurities that might also yield oxalic acid. The method of determination, based on the amount of potash required to saponify the neutral fat which is sometimes used, has all the faults of an indirect determination, and is therefore not to be recommended if any other process is available. Dr. Lewkowitsch has experimented with the so-called acetin method of Benedikt and Cantor, and has shown that it gives very concordant and accurate results. The process is based on a reaction which may be expressed by the following equation—

$$2C_3H_5(HO)_3+3(C_2H_3O)_2O=2C_3H_5(C_2H_3O_2)_3+3OH_2,$$

the weight of acetin formed being proportionate to the amount of glycerine present.

In addition to the glycerine estimation, the total amount of fatty acids present in the sample has also to be determined.. As these acids are partly soluble and partly insoluble in water, a determination of the amount of caustic potash required to neutralise the soluble (Reichert's value) and insoluble (Hehner's value) portions is first made, and the sum of the two results gives the amount of base required to saturate all the fatty acids present. This, Köttstorfer's well-known process, and the result, if caustic potash is the base employed, are Köttstorfer's values—*i.e.*, the number of milligrammes of KHO required to neutralise the fatty acids present in one gramme of fat. By titrating the undecomposed fat with alcoholic solution of potash, the amount of free acids, or acids uncombined with glycerine, are determined. This does not give the actual weight of these acids, as we do not know their molecular weights, but from the value obtained, by assuming that the free fatty acids have a molecular weight which is the mean of those present in the fat itself, an approximate value is arrived at. The fatty acids present may be conveniently divided into two classes, viz., saturated and unsaturated, the amount of the latter being determined by Hübl's iodine reaction. Their lead salts are also soluble in ether, which further differentiates them from the insoluble lead salts of the saturated acids. These two methods, and a determination of the mean molecular weight as above, will, in the majority of cases, be sufficient to enable the investigator to determine what fatty acids and how much of them are present.

A qualitative method for determining the nature of the acids present has been devised by Hazura, based on the fact that the unsaturated acids are oxidised by alkaline permanganate to saturated di-hydroxy-acids, which are sufficiently well characterised to be easy of identification. The determinations necessary then, are :—(1) Hehner's value for insoluble acids ; (2) Reichert's value for the soluble acids ; (3) Köttstorfer's value ; (4) mean molecular weight of the insoluble acids by calculation ; (5) the free acids ; (6) the glycerine by the acetin method ; and (7) Hübl's iodine value of of the fatty acids.

The method proposed by Benedikt for the detection and determination of the hydroxy-fatty acids, based on the fact that they are converted into acetylo-acids on heating with acetic anhydride, according to recent researches, leads to erroneous results, as it is found that all the fatty acids on being boiled with acetic anyhydride yield the anhydrides of the fatty acids.

REPAIRING INJECTORS.

IT frequently happens that an injector refuses to work readily and can only be started by persistent effort, the indications being that something is wrong inside. Investigation fails many times to show where the trouble lies, as everything about the injector is apparently in proper shape. When trouble of this kind occurs the fault can generally be located in the nozzles, which have become coated with a layer of incrustration, formed from the sediment and impurities of the water, which adhere to the inner surface of the nozzles, forming a thin, smooth scale. This scale, in spite of its extreme thinness, has considerable effect on the action of some injectors, and is the cause of a great deal of annoyance until removed. It may be easily removed by taking out the nozzle and placing it in a solution of one part muriatic acid, in ten to twelve parts water. This solution will dissolve the scale completely, without doing any injury to the metal. In most cases it is necessary to leave the nozzle in the solution for a couple of hours only, sometimes it may dissolve in less time, although at others it may require as much as 24 hours, depending principally on the nature of the scale and the strength of the solution ; but if the solution is warm its action will be increased. An occasional treatment of this kind will keep the nozzles clean and the injector in good working order.

SMOKE ABATEMENT.

MR. ROBERT ASCROFT, solicitor, of Oldham, has made some rather novel suggestions in respect to remedying the smoke nuisance. In a letter he says:—"All kinds of appliances have been recommended, but, so far, neither county nor borough justices, corporations, nor local authorities, have felt justified in taking upon themselves the responsibility of saying what means shall be adopted. With the law in its present unsatisfactory state, things seem to be at a deadlock, and if any means can be suggested by which (without unduly interfering with the staple industries of the district) emissions of dense black smoke can be reduced to a minimum, it will be well worth while that the same should have due consideration." In order to get over the "deadlock" he makes the following proposals:—1. Let all owners and occupiers of premises, having furnaces which emit black smoke, form an association, and pay an annual subscription of, say, £1. 1s. and £2. 2s. a year. 2. Divide the mills into the requisite number of classes, on the basis of a fixed number of boilers to each chimney. 3. Let there be special classes for such as have mechanical stokers or other appliances. 4. Let the association appoint a competent man to devote the whole of his time in taking observations of the various chimneys. After providing for his salary, the surplus funds can be divided into prizes, and distributed every three months amongst the successful competitors. He then goes on to observe that "it is needless to say that the observations would be a valuable guide to the millowner, and, to a great extent, a check on those taken by the representative of any local authority or individual. Mr. Ascroft suggests that the stokers in the district should be made members on paying a nominal sum of 1s. per year. If the above is practicable, there is no difficulty in putting it into shape and commencing at once. The amount of fuel saved by careful and judicious firing would be enormous, and the smoke nuisance would become a thing of the past. The annoyance of constant smoke prosecutions, with the accompanying lawyers' bills and court costs, would be avoided. Every stoker would be doing his best, and this means that he would accomplish his object. For twelve months the above can be done for every mill in Oldham at a less cost than putting in machine stokers to a single mill with half-a-dozen boilers." Mr. Ascroft, as a lawyer, certainly exhibits disinterestedness, inasmuch as he has been called upon in the course of his professional duties to defend a large number of millowners in smoke prosecutions.

NEWCASTLE CHEMICAL WORKS COMPANY.

THE PROPOSED TRANSFER.

A SPECIAL meeting of the members of the Newcastle Chemical Works Company, Limited, was held this week at the County Hotel, Neville-street, Newcastle, to consider the proposed transfer of the concern to the United Alkali Company, Limited. We understand that, circulars having been addressed to the members, answers approving of the sale were received from shareholders representing 51,923 out of 60,000 ordinary shares, and 57,767 out of 60,000 preference shares. Mr. Wilton Allhusen, chairman of directors, presided at the meeting, and there was a large attendance of members. Two resolutions were submitted by the chairman. The first was to the effect that the company be wound up voluntarily, with Mr. J. E. Davidson as liquidator. The second resolution was to the effect that the liquidator be authorised to carry out the arrangement for the sale of the property and business to the union on the terms provided for by a provisional agreement, dated October 23rd, 1890. We are not at liberty to disclose the price which the shareholders are to receive, but it is understood to be the largest that is to be paid by the union to any one of the Leblanc manufacturers, and it was very satisfactory to the shareholders at the meeting, who adopted the resolutions unanimously. Mr. Davidson late secretary of the Newcastle Company, stated that, as one of the committee of inspection under the union, he had visited all the Leblanc works, with two unimportant exceptions, in the United Kingdom, and the works of the Newcastle Chemical Works Company were the best equipped and most substantial of all. The Chairman said that the United Alkali Company could not be formed without adhesion, and what was a good bargain for their own company was also a good bargain for the United Company, who obtained a first-class current going chemical works, which would cost to-day to erect every penny of the substantial sum they had agreed to pay for it. With the moderate control of prices which they would obtain, the works at Gateshead should be as profitable as they had been in bygone years. Many kindly references were made to the late Mr. Christian Allhusen, who, for a great number of years, was the mainstay of the Newcastle Chemical Works Company, and the trustees of whose estate will be interested largely in the new company. Cordial votes of thanks were also given to the chairman, Mr. Wilton Allhusen, and to Mr. Alfred Allhusen and Mr. J. E. Davidson, his co-directors.

A UNIVERSAL FURNACE!

DR. J. BAXERES, a well-known metallurgist, of Oporto, Portugal, has recently brought out a remarkably ingenious invention, to which he has given the name of the "Universal Furnace." The theory involved in the perfection of this invention has long been familiar to metallurgists, but it has been reserved to Dr. Baxeres to solve a problem which has hitherto baffled the skill even of the most ingenious. This furnace, says *Kuhlow*, will smelt and refine in a single operation, and by what is known to chemists as the dry process, every description of mineral, no matter what its composition might be—whether poor or complex, silicious or pyritous, and even sulpho-arseniurets are as effectually reduced by its operation as any other metallic compound. Thus ores of iron, lead, zinc, copper, antimony, nickel, tin, silver, gold, etc., can all be readily fused by this method, which is based upon the chemical affinity of the alkalies and salts of alkaline and alkaline-earthy metals with volatile elements and with the metalloids mineralising the metals, thereby forming definite salts, including oxides, hydroxides, sulphurets, arseniates, antimoniates, etc., from which the metal is obtained in a free state, with or without the addition of carbon, or in other words, completely demineralised. This result is obtained by melting the minerals, after trituration and mixing in definite proportions with oxides of potassium, calcium, magnesium, or barium, or with their carbonates, nitrates, sulphates, fluorates, borates, chlorides, etc., any of these substances, alone or in combination, and with the addition, if necessary, of a simple flux, appropriate to the substance to be treated. The reduction is effected by means of closed crucibles of iron or other refactory material capable of resisting the highest temperatures, and these crucibles subjected to the action of circular involving flames, kept in continuous action, form the chief features of the furnace. Thus far as regards what we may call the chemistry of the Baxeres process. The advantages of the process are said to be very numerous, and may be briefly enumerated as follows:—

1st. The possibility of reducing the minerals expeditiously and without loss on the very spot where they are extracted; thus realising the difficult problem of the immediate conversion of the substance into marketable value.

2. To profitably treat at the mouth of the mines the most impure and complex minerals of the richer species, avoiding the usual costly mechanical concentrations and expensive transport of the minerals, and obtaining at the moment of extraction the full metallic value of the minerals, together with the whole of the gold or silver contained in them.

3rd. The easy utilisation of refuse, waste matter and metallic dross of lead, copper, nickel, silver, and gold, by melting on the spot.

4th. By the temperatures easily obtained and controlled, in this furnace, from a low point to the highest, so suit all the necessary metallurgical formulæ, it is possible to obtain by successive operations, firstly, a metal of low fusion point; secondly, another of a medium point, and thirdly, another of a high point, etc., thereby solving a great desideratum in the metallurgy of complex minerals, from which until now, it has been well-nigh impracticable to extract the whole of the metals.

5th. By means of the closed crucibles the furnace transforms the mineralizing elements of the metals into definite salts, and leaving at liberty (with the great advantage of suffering no loss by volatilization) the greater part, which is capable of yielding pure metals in a single operation, besides the important benefit of not contaminating the atmosphere either with injurious gases or with phosphoric, arsenical, antimonial, and other poisonous vapours.

6th. The facility of transporting these furnaces and erecting them in the most isolated regions, thus overcoming the hitherto insurmountable difficulties encountered in the treatment of ores on the spot.

7th. When once erected any of these furnaces can be maintained at a trifling cost; they are simple and easy to manipulate, and do not require much personal attention; they are economical in the consumption of fuel, which may be wood, turf, peat, lignite, coal, coke, etc., consuming, in fact, any kind of fuel; high temperatures are easily maintained without intermission, as it is only necessary to recharge and graduate fuel and draught, in order to keep up the required fusing point.

We need hardly point out that, as a general rule, a modern blast furnace, with all its gear and necessary machinery, ventilators, motors, generators, etc., will require an outlay of from 80,000 dols. to 110,000 dols., whilst a Baxeres furnace, etc., would not represent an outlay of over 12,000 dols. In a modern blast furnace, installation of feeders, mixers, crusher, on account of the expense of fuel, melting materials, labour, etc., every ton of ingots produced costs on an average 5 dols.; but in a Baxeres furnace the cost, as a rule, rarely exceeds 2·50 dols per ton. A modern blast furnace is bound to be kept continuously at work, through the risk of otherwise imperiling its structure by cooling, contraction, expansion, etc., whilst

the Baxeres furnace can be lighted, worked, and extinguished at any time, and without risk of any kind. Moreover, a modern blast furnace can effect, at the utmost, three charges during twenty-four hours, which, calculated at a high average of 75 tons at a time, makes a daily total of 200 to 250 tons; whilst the Baxeres furnace is able to complete 50 discharges in the twenty-four hours, on a round output of 500 tons daily. The quality of the ingot produced by the "Universal Furnace" is claimed to be very much superior to that obtained by the modern blast furnace, the former being a chemically pure product, although it may have been obtained from the poorest and foulest minerals from marshy districts. This result is due to its reduction having been effected without the ores being brought in contact with the combustible matter, as happens in the ordinary blast furnace. In the metallurgy of the simple and complex species of silver minerals, the advantages of the "Universal Furnace" are of the greatest importance. No preparatory mechanical concentrations for example are necessary, the silver standard being sufficiently remunerative. Calcinations for the purpose of volatilizing the mineralizing elements, such as sulphur, arsenic, antimony, etc., are, of course, obviated also. Amalgamation is, moreover, dispensed with, so that the absolute elimination of quicksilver, which is replaced more rapidly and economically by the lead minerals, impregnated by silver or gold, up to 75 or 80%, is likewise secured. On these grounds, therefore, it is contended that the adaptation of the mineral products enumerated, and more especially to gold or silver, cannot fail to bring about one of the most important industrial revolutions of the present generation. The furnace has been in operation for some years past in the works of Messrs. Baxeres and Co., at Oporto, and the claims made on its behalf by the inventor are supported by unimpeachable testimony.

BLEACHING OF ANIMAL FIBRES WITH SODIUM HYDROSULPHITE.

THE bleaching process with sodium hydrosulphite, which has since 1883 been industrially employed, yields excellent results, but, as is also the case with bleaching by sulphurous acid, the fibres thus bleached are unfit for dyeing. For the production of hydrosulphite about 300 litres sodium bisulphite 35—40° Bè. are put into a pinewood tub of 500 litres capacity, to which scraps of pure zinc are added until they reach the surface of the liquid (the volume of metal must not be more than ¼ of the total volume), when the tub is covered up. In order to prevent a too high temperature, earthenware tubes are inserted into the tub, in which cold water circulates. After one hour the liquid is drawn off into a tub which is always to be kept full, covered and allowed to stand for twelve hours, when an abundant amount of zinc-sodium sulphite has crystallized out. The remaining liquid portion is the bleaching agent. As the latter, by the contact with the air, is apt to be converted into sodium bisulphite with rising temperature, the tubs for the production of hydrosulphite, as well as for bleaching with it, must always be kept as full as possible, and carefully covered.

For bleaching, the material is first well cleaned—*i.e.*, treated with sodium carbonate and then with soap—and entered into a 1,000 litres tub containing a mixture of the bleaching liquid with an equal volume of water, taking care that the tub is nearly filled. After standing covered for six hours the yarn is well wrung, and piece goods passed through pinewood squeezers above the tub. Then the material is at once washed in filtered water; if this washing is delayed, the fibres are, by the contact with the air, rapidly heated up to 70—80°, and greatly altered. Sometimes goods thus bleached, after finishing, show stains which are attributable to remnants of zinc-sodium sulphite. They are removed by passing the pieces through a cold, very weak bath of hydrochloric acid and washing in abundant water.

With one single bleaching tub 3,000 pieces of woollen goods at 100m. each—*i.e.*, about 36,000 kilos. wool—can be bleached per year. About 100 kilos. zinc serves for several years, because the undissolved metal can be rendered serviceable for further use by washing it with abundant water, which is feebly acidulated with hydrochloric acid. The price of bisulphite is about 25 frs. (£1.) per 100 kilos. When the bath falls below its original level it is filled up with dilute hydrosulphite, whereby the strength of the bleaching bath is preserved for almost an unlimited period. In a tub of 1000 litres capacity about 130 kilos. wool can be entered at a time, the cost amounting to about 1·36 fr. (about thirteen pence) per 10 kilos. fibre. The simple and cheap process, which has been worked in some factories for several years, is probably destined at no distant time to supersede the ordinary bleaching methods.—*Chem. Zeit.*

MUSCOVITE MCKINLEYS.—It is reported that the Russian Customs Tariff Commission now sitting in St. Petersburg has decided to double the duties on chemical products in the new tariff, which is expected to come into force early next year.

ON THE MANUFACTURE AND UTILITY OF NAPHTHA CANDLES.

THE so-called naphtha candles were recently shown at an exhibition in St. Petersburg, and although at one time great hopes were entertained of them, it was found that they were not suitable for use.

They consist chiefly of a mixture of ammonia soap, stearic acid, and mineral oil, this mixture becoming a solid mass, which can be moulded into candles. Such candles, however, smell unpleasantly, as the mineral oil gradually evaporates away. The candles exhibited were made from a mixture composed of 65 per cent. of stearic acid, 30 per cent. of mineral oil, 5 per cent. of water, and about 0·8 per cent. of ammonia. An analysis, made about a month after the candles were manufactured, showed from 10 to 12 per cent. of mineral oil, 82 to 85 per cent. of stearic acid, 4·5 to 5 per cent. of water, and 0·6 to 0·75 per cent. of ammonia. To diminish the evaporation of the mineral oil, the candles were coated with various kinds of varnishes, but this, besides being expensive, was not a satisfactory device. The appearance of the candles was also bad, as they were yellow coloured with white spots. They burned with an unsteady sooty flame, and satisfactory photometric observations could not be obtained.—*Dingl. Polyt. Jour.*

Legal.

HIGH COURT OF JUSTICE—QUEEN'S BENCH DIVISION.

Before MR. JUSTICE DENMAN *and a Special Jury.*

DYSON V. THE BRIN'S OXYGEN COMPANY (LIMITED).

THIS was an action brought to recover damages for injuries sustained by the plaintiff by the bursting of a pressure gauge sold and supplied by the defendants for the purpose of testing the pressure of oxygen compressed in steel cylinders.

Mr. Moulton, Q.C., and Mr. Morton Smith were for the plaintiff; Mr. Gainsford Bruce, Q.C., and Mr. Giles were for the defendants.

The plaintiff carries on the business of a caterer for public amusement, and travels about the country with a panorama, providing pictorial and musical entertainments, and, prior to receiving a circular from the defendants, used gas for his magic lantern exhibitions in gas bags, but after some correspondence the plaintiff wrote in December, 1889, that he wished to have a good gauge to use in conjunction with cylinders containing compressed oxygen gas supplied by the defendants for the purpose of throwing a better light on the diorama, and on the 29th the defendants replied that they were out of stock, but would get one elsewhere, and subsequently supplied one said to be capable of 120 atmospheres. This was first used in February following, and on March 6th, when the company were at Rochdale, the plaintiff was testing the gauge to ascertain whether the cylinder was full. His assistant turned the tap and the finger of the pointer rose nearly to 10, when suddenly the gauge burst and an explosion occurred. The plaintiff sustained serious injuries to his face, losing the sight of his left eye, and the sight of his right eye has also become endangered. He now claimed damages for these injuries through the alleged negligence and carelessness in the construction of the gauge. The defence was that the gauge was properly made; that it had been tested three or four times before being sent out; and that every care had been taken to see that the gauge was of abundant strength, and that it had been exposed to some abnormal and extraordinary pressure; and they further pleaded that they did not make the gauge, but that it was an article generally sold as a pressure gauge; and that the contract between them and the plaintiff was for the supply of a gauge in general, and not for a gauge for a specific purpose. At the close of the case, his Lordship summed up, and reviewed in detail the whole of the evidence, leaving the three following cases to the jury:—1. Was the gauge fit or unfit for the purposes for which the plaintiff knew it was supplied? 2. If unfit, was the plaintiff injured by the bursting of a tube, which bursting was due to the unfitness of the gauge? 3. Were the defendants guilty of negligence in turning out the gauge as it was turned out? He said he did not leave them the question of damages, because the parties had most properly agreed upon a sum in the case of the defendants being liable.

The jury found that the gauge was unfit; that the plaintiff was injured by the bursting of the gauge occasioned by its unfitness; and that there was negligence on the part of the defendants.

On these findings his Lordship gave judgment for the plaintiff for £325. (the agreed sum).

NOTICE.

WE beg to inform our readers that the lecture on "Chlorine Production" announced for February 3rd, at the Manchester Technical Laboratory, will not take place.

This is rendered necessary by the fact that we are preparing a large working model of the plant to be used in our new process of "Sewage Treatment," which will be shown, in operation, at the lecture on

March 3rd, 1891, at 7 p.m.

We will reserve seats for this lecture for such of our friends who desire to be present and who will notify the same to us, and it may be well to state that we expect a large attendance.

Tea and coffee at 6-30 p.m. in the Exhibition room.

THE EXTRACTION OF NICKEL AND COBALT.

ABOUT a year ago the mode of proceeding, which had been patented in nearly all states, of Herr Wilhelm Schöneis, for the winning of pure nickel and cobalt solutions from the relative ores and smelting products, excited much, and as we may say to-day, just agitation, and met, like every novel thing, with suspicion, which showed itself principally in assuming that the capability for the satisfactory working out on a large scale, was very doubtful. To day all scruples have subsided for the "Hütte Silberhoffnung" in Beierfeld, in the Erzgebirge, which has acquired extensive natural beds of cobalt, has used this process practically for some time, under the personal management of the gentleman mentioned before, who directs the working of the mine.

The works treat the ores in this way; they are smelted in shaft-furnaces into coarse metal containing 6—12 per cent. cobalt, and then there is extracted from this coarse and roasted metal, according to the patented process, the copper, nickel and cobalt which it contains, leaving behind the pure black specular iron.

The changing of the metals to be effected is done in muffle-furnaces by the help of proto-chloride of iron, and each furnace-charge lasts about two hours. After the lapse of this time, the chloriding is finished and now the lixiviating begins, which is done in wooden cisterns with double bottom; wherein the metals are dissolved with some iron. The strong concentrated solution thus gained, is worked into oxide of cobalt or concentrated, and then sent into the trade as enriched cobaltic salt, which is free from iron.

The advantages of this process, in comparison to those used formerly, are easily understood, taking into consideration that one is capable—by this single manipulation—to produce directly from poorer products pure concentrated solutions of cobalt, whereas until now this could only be effected by often repeated remelting processes, thus gaining an enriched coarse-metal, from which—after it had been roasted and worked with water—nickel and cobalt could be gained by the dissolving in muriatic acid; and then even there was the faultiness of much iron going into the solution, and part of the nickel and cobalt remaining behind undissolved.

The expenses of this new process, and that must not be overlooked, are small, for in the first place the nearly worthless protochloride of iron, liquors from the manufactories of precipitated copper, are used for it, and, in the second place, the pure black oxide of iron remaining behind, can be used for different purposes, thus reducing the expenses considerably.

What influence this new process for oxide of cobalt is to gain in the metal market, the future will show, and we firmly believe that the present very high price, for oxide of cobalt, will soon experience a reduction.

We stand again at a turning-point, and look forward with interest to the further successes which the "Hütte Silberhoffnung" will have to record, an interest all the greater, because with this process there is also connected the winning of copper, silver, and gold, and there is no doubt that these metals may be gained as easily as nickel and cobalt.

COMPRESSED PAPER is used now as a substitute for wood, in the manufacture of shuttles and their wheels, for looms. They are manufactured largely in Berkshire County, Mass.

THE BONE TRADE IN INDIA.

THE Government of India last October invited the attention of Local Governments to the increasing exportation of bones from India, and asked the Department of Land Records and Agriculture in Bengal to embody remarks on the use of, and trade in bones, in its annual reports. From information gathered on the subject in Bengal, it appears that within the last few years the collection of bones from village wastes for export to Calcutta has become the regular profession of a low caste of Hindus—Chamars—and is gradually extending to the outer parts of Bengal, in proportion to the increasing demand of the Calcutta mills, and the extension of railway communication. Heaps of raw bones collected for transport to Calcutta may now be seen along the railway and principal river routes of Bengal. Bones are also collected by the indigo planters of Behar for use on their indigo land. Many of them have erected mills for grinding them to dust. The bones brought into Calcutta are bought up for manufacture into bone-meal. With the exception of a comparatively small quantity of bone-meal sent out to tea-gardens, the report says the whole of the out-put of the bone-grinding mills in Calcutta is destined for export. The price of bone-meal is said to range from R2 to R2-8 per maund, according to the degree of its fineness and purity.

Numerous experiments to test the efficiency of bone-meal as a manure for paddy have been made in Burdwan and Hooghly. It could not, however, be ascertained how much of the increased yield on any plot manured with bone-meal was due to this manure alone, for in most of the experiments bone-meal was mixed with saltpetre, hide-salt, etc., and the experiments made by the ryots were devoid of precision. The best guide to the value of this manure would seem to be the evidence of the ryots who have tried it. The testimony of the ryots and farmers was nearly uniform to the effect that bone-meal is quite as good a manure as oil-cake for paddy, potatoes, and sugar-cane, but that its effect does not last for more than a year, and that better results were obtained in sandy than in clayey soils. Although bone-meal is acknowledged to be a good manure, oilcake is believed to be superior to it in many respects. It is also much cheaper than bone-meal, and is open to no objection on the ground of caste feeling. Until, therefore, bone-meal can be offered at cheaper rates than oil-cake, there seems to be no hope of its general adoption in native agriculture.—*Madras Times.*

Correspondence.

ANSWERS TO CORRESPONDENTS.

G. C. A. S.—The Institute of Chemistry, 9, Adelphi Terrace, London, W.

W. W. & Co.—You will find in our advertising columns the names of makers of hydrochloric acid pumps.

A WORKS' CHEMIST, B. A., F. C. S., G. M. and P. P. C.—We are pleased to hear the article on Works' Chemists was of so much interest.

J. B. & Co. LTD.—Yes, there are several *trade secrets* in connection with the production of high-class razors.

M.—No, it is simply a worthless imitation, the price alone should make you suspicious.

STENCH.—Permanganate is all very well, but we would supplement it with carbolic acid.

COAL.—No, try a gas producer.

*** *We do not hold ourselves responsible for the opinions expressed by our correspondents.*

NITROUS SULPHURIC ACID AND SULPHATE OF AMMONIA.

(To the Editor of the Chemical Trade Journal.)

SIR,—Like your correspondent, "W.M.," I should be glad to know what is the influence exerted by the nitrous gases (present in varying quantity) in the sulphuric acid used during manufacture of sulphate of ammonia. I have had experience in using sulphuric acid containing a comparatively large volume of nitrous gases, and also of other acids containing a small volume of those gases. No difference of colour in the sulphate produced from the two acids has been observed, but the workmen engaged at the saturators say that their eyes are injuriously affected by the acid containing most nitrous gases. This fact has not yet been made perfectly clear to me, beyond the coincidence that during a period when we used nitrous vitriol several men suffered from temporary blindness, and that during a shorter period when we used non-nitrous vitriol no such case of injured eyesight occurred.

ENQUIRER.

Trade Notes.

A New Disinfectant.—Since we have learnt to be terrified by the ubiquitous microbe, means for combating him have multiplied and flourished. The latest disinfectant is called "lysol," and appears to be our old friend carbolic acid (whose reputation is seriously on the wane) emulsified, and thereby made more active. The emulsifying agent is an ordinary fat or resin soap, but the peculiarity of manufacture lies in the fact that the tar acid is incorporated with the soap at the moment of saponification. The customary proofs of efficacy are forthcoming, and duly chronicled in the German edition of the proceedings of the British Association which have recently been issued at Bremen.

Rapid Determination of Arsenic.—One gramme or a gramme and a half of the matter to be assayed is, says the *Pharmaceutische Centralhalle*, thoroughly dried and finely pulverised. Add from 20 ccm. to 25 ccm. of fuming nitric acid and evaporate to dryness. When this has been done, add 30 ccm. caustic soda solution of 30 per cent., and boil for several minutes. The liquor is then filtered, and 200 ccm. of distilled water added to the filtrate. Take 25 ccm. of the mixture and acidify with 2·50 ccm. of a solution of acetate of sodium in 50 per cent. of acetic acid, and titrate with a quarter-normal solution of uranium acetate (acetate of uranium, 17·10 gramme. glacial acetic acid, 15 ccm. ; water, 2·1). The calculation may be made on the basis of 1 ccm.=0·00125 gramme arsenic.

Estimation of Indigo.—In *Romen's Journal* there is published a process for the determination of indigo, which is simple enough to be gone in a works' laboratory, and may yield good results. One dramme is taken, ground as finely as possible dry, and then still further ground with water until the utmost degree of division possible is attained, transferred to a flask marked in the neck at 250 cc., 3 grammes zinc powder, and 6 grammes caustic soda added ; it is stirred up from time to time, and the reduction will be complete in an hour or two. By means of a pipette 50 cc. of clear liquid are drawn off, and placed in a shallow basin, and exposed to the air for 30 minutes, then an excess of hydrochloric acid added, the precipitated indigo collected on a filter, washed, dried, and weighed.

A Year's Strikes and What They Cost.—A report by Mr. J. Burnett, Labour Correspondent to the Board of Trade, on the strikes that occurred last year has just been issued. From this it appears that in 1889 strikes took place in 3,164 establishments in this country. As in 1888, and due to the same reason—namely, a rising labour market—67 per cent of the strikes were due to claims for advanced wages, although in some cases there were other points of dispute also involved. Of those for advances in wages 48·3 per cent. were successful. The proportion of those partially successful was 31·5 per cent. ; 10·7 per cent. were not at all successful, and the results were unknown in the remaining strikes. Of the financial aspect of strikes some interesting particulars are given. Taking 597 of the strikes, the loss of wages is estimated at £652,000., while the loss to each individual would be a little over £3. 5s. For 930 of the strikes the loss for the 344,840 persons engaged is taken at £1,122,500. In 216 instances it is shown by employers whose men have been on strike that the value of fixed capital laid idle was £14,450,962. ; while in 169 instances the rateable value of property laid idle was £268,684. In 233 strikes the estimated outlay caused for laying down and reopening the works on strike was £169,219. On the other hand, the returns sent in by trade unions show that in 369 strikes the amount expended in support of men by strike committees or trade unions was £63,636. The returns also show that in 448 strikes the weekly wages earned before the stoppages amounted in the aggregate to £153,504. ; while the estimated loss of wages in 292 of these strikes was £294,175.

Gas Purification.—It is well known that an analysis of a gas purifying mass does not indicate its value. Factors that require to be taken into consideration, besides the composition of the material, are:—Weight, size of grain, moisture, the substance for rendering the mass more penetrable, the depth of the layers, the velocity and difference in pressure of the gases previous to entering and after leaving the purifier. In order to find the highest value of a certain purifying mass, the author passed a current of pure sulpheretted hydrogen over the finely-powdered material, retaining the water which was produced by phosphoric anhydride. Even after passing the current through for twenty hours, complete saturation did not take place. The chief action was over after three hours. Pure ferric hydroxide absorbs on an average after the first saturation, 30·77 of sulphur, different varieties of bog-iron ore 11·2—28·41 ; the theoretical amount of sulphur corresponding to the amount of iron oxide present varied from 18·06—42·69. From this it will be seen that in no case, not even that of pure ferric hydroxide, was the maximum absorption equal to that theoretically possible. And it does not appear that there is any relation between the amount of iron in the material and the amount of sulphur absorbed. Referring to the difference in absorbing capacity, as influenced by certain physical conditions, the author, E. Schilling, of an article in the German *Gas Lighting Journal*, says that the quantity of sulphur taken up was doubled by interspersing wood shavings in the mass.

Natural Gas in Cheshire.—The Salt Union, believing that under the salt deposits of Cheshire are oil, gas, or coal, have commenced boring operations at Olershaw-lane, Marston, Cheshire. The borings are not yet sufficiently deep to determine whether the Union will be successful, but geologists have confidently informed the directors that under the salt beds natural oil or gas will certainly be found. The work is being prosecuted with the utmost vigour.

Dyeing Silk.—A new process for the dyeing of silk has been patented in France. It consists chiefly in the use of a "reduction bath," which appears to consist of a concentrated solution of magnesium chloride, containing chloride of tin ; any other saline body may be used, but the magnesium salt gives the best results. The saline body prevents the precipitation of the tin as oxychloride, which ordinarily happens when using tin crystals. After the silk has been passed in this bath, which contains one per cent. of chloride of tin, it is passed into a solution of catechu or other tannin products, whereby tannate of tin is deposited on the fibre, and the latter is weighted accordingly, and is also in a suitable condition for dyeing with the basic aniline colours. It is claimed that greater economy in the consumption of tin and catechu is effected by this process, also that the silk is more easily washed, less soap is required, and the tenacity and elasticity of the silk is better preserved by the fixation of the tin in the cold. The patent, however, specifies the use of baths at a temperature of 70° C., which is far from being cold.

Market Reports.

TAR AND AMMONIA PRODUCTS.

The benzol market remains in the same position as reported last week, and by many makers it is thought that the top prices have been reached. Most other tar products are firm with the exception of carbolic acid, which is still in a very weak condition. Anthracene remains without change, while pitch can scarcely be stated as satisfactory.

The sulphate of ammonia market has a much stronger tone, and parcels keep moving off at advanced prices. Parcels for Hull shipment are now quoted at £10. 15s., and even £10. 17s. 6d., the same prices holding good for Liverpool, and £10. 13s. 9d. to £10. 15s. at Leith. At the present moment there is but very little offering, and in the ordinary course of events sulphate ought to go dearer still.

REPORT ON MANURE MATERIAL.

The market continues very quiet in all positions, and there have been no important fluctuations in prices to notice.

The quotations for mineral phosphates remain without change, buyers being pretty well supplied for the coming season, and being still disposed to wait before completing their purchases.

Cargoes of River Plate bones are worth about £5. 2s. 6d. delivered U.K., though 2s. 6d. more is generally asked. Crushed East Indian bones for shipment ahead are worth £5 2s. 6d. per ton ex quay Liverpool, and on spot £5. 3s. 9d. to £5. 5s. ex quay. Shipments of East Indian bone meal are coming forward very irregular in quality this year, and value must be quoted at £5. to £5. 10s. per ton, according to quality, ex quay Liverpool. Rough grinding bones are still enquired for, and £5 5s. would probably be paid for clean hard bones for charring purposes. There are sellers of River Plate bone ash at £5., on 70%, nett cash, Hamburg terms, but U.K. seems to be now fully supplied.

The nitrate market is very quiet, there being no confidence in the prospects of any immediate or early combination on the part of the producers, and the shipments being unprecedentedly large. Spot price is still 7s. 9d. per cwt for low test up to 8s. for refined quality. Due cargoes are not worth over 7s. 7½d. per cwt., and October-November shipments must be quoted at about 7s. 9d. per cwt.

A cargo of Liebigs guano is reported to have been sold at 10s. per unit of ammonia, and 1s. 3d. per unit of phospate of lime. This price would probably be accepted for a further cargo. There is considerable enquiry for dried blood, but not much business has resulted. Nearest value is 10s. 3d. per unit, free to rails at works, for fine home prepared, and 7s. 9d. to 10s. for River Plate.

Superphosphates remain without alteration.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Our market is quieter again, but not accompanied by any special break of prices, the quotations as given below being for the most part pretty firm. Sulphate of copper is a further shade enhanced, and chlorate of potash also is dearer, and very firm of position. Caustic soda continues at the same quotations as last week, and with the position fairly maintained. There has been a drop of 10s. in borax. As regards sulphate of ammonia there has been no movement at all towards improvement, and the very low quotation of £10. 10s. Leith remains unimproved, and the market is very dull, if indeed it may not be described as dead. Up to last week the low price was done by second hand men only, but it is now known that at least two of the makers have sold on the same terms. The feeling of the manufacture is still apprehensive, and some are of opinion that the lowest has not been touched. Makers of bichromate of potash and bichromate of soda have to complain of a still feebler market with prices not at all rigid, although the figures given below are the nominal terms. One of the works is now in the hands of the United Company. The other two remain in private hands, and the cutting is keen.

Chief prices current are: Soda crystals, 56s. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 2½%, Tyne; caustic soda, white, 76°, £13. 10s., 70/72°, £11. 5s., 60/62°, £10. and cream, 60/62°, £9. 12s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £8., and 1 cwt. casks, £8. 5s., net Tyne; refined alkali, 48/52°, 1⅝d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £6. 7s. 6d. to £6. 15s., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 3½d., nett, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. nett, f.o.b. Glasgow; chlorate of potash, 5½d., less 5% any port; nitrate of soda 7s. 10½d. to 8s.; sulphate of ammonia, £10. 10s. f.o.b. Leith; salammoniac, first and second white, £37. and £35., less 2½% any port; sulphate of copper, £18. 10s., to £18. 15s. less 5% Liverpool; paraffin scale, hard 2¾d., and soft 2⅝d., per lb; paraffin wax, 120°, semi-refined, 3⅝d.; paraffin spirit (naphtha), 9d. a gallon; paraffin oil (burning), 6d. to 6¼d at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 5s. to £6. 10s., and 890/895°, £7. 10s. to £8. Week's imports of sugar at Greenock, were 44,552 bags.

THE LIVERPOOL MINERAL MARKET.

The firmness reported in our market last week has continued, and prices all round are pretty strong. Manganese: Arrivals still small; stocks have been further reduced, and prices remain firm. Magnesite: Sales of raw lump very slow—it can be bought at almost any figure, nominally 30s. Raw lump, 30s. to 40s.; raw ground, £6. 10s., and calcined ground £12. 10s. Bauxite (Irish Hill brand): The demand continues to increase, and prices for all qualities remain very strong; lump, 22s.; seconds, 18s.; thirds, 14s.; ground, 35s. French chalk: Arrivals this week are rather small; the whole of them have gone into consumption, and prices are firm as last reported; G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate quieter; sulphate in increased demand, best qualities "Angel White," No. 1, 70s.; No. 2, 60s. to 65s.; No. 3, 45s. Pumicestone: Lump and ground more inquired for. Iron ore: The demand is fair; manganiferous in request, and prices firm. Santander, 9s. to 10s. 6d., f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Emerystone: The demand for best brands continues to improve; No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: More inquiry; 45s. to 50s. for best blue and yellow; fine impalpable ground, £7. Scheelite, wolfram, tungstate of soda, and tungsten metal sought for at good figures. Chrome ore: High grades inquired for at full prices. Antimony ore and metal firm as last quoted. Asbestos in strong demand, especially Canadian rock. Potter's lead ore: "standard" brands improving in figure; smalls, £13 to £14.; selected lump, £15. to £16. Calamine: Good qualities in demand at advanced prices. Strontia sulphate (celestine) steady, 16s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: A good business doing; English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, quieter. Plumbago firm; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, 20s. to 22s. 6d. Ground mica, £50. China clay easier; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), inquired for, finest quality 22s.

THE METAL MARKETS.

LONDON, Wednesday.—Pig iron steady. Scotch warrants closed at 46s. 6d. cash and 46s. 9d. one month. Middlesbrough, 43s. cash; hematite, 54s. cash. Copper easier. Chili bars, G.O.B.'s and G.M.B.'s closed at £54. 7s. 6d. to £54. 15s. cash, and £55. to £55. 7s 6d., three months. Tin fell £1. Straits closed at £91. to £91. 10s. cash, and £91. 10s. to £92. three months; Australian, £91. 5s. cash. English ingots, £95. Lead: Spanish, £12. 10s.; English, £12. 12s. 6d. Silesian Spelter: ordinary, £23. 12s. 6d. Quicksilver, first hands, £9. 5s.; second hands, £9. 1s. Copper shares easier; Cape fell ⅛ to 5⅞; Copiapo fell ⅛ to 2¾; Mason and Barry, 7⅜ to 7⅛; Namaqua, 2¼ to 2; Rio Tinto fell ¼ to 23 11/16; Tharsis fell ⅛ to 4¾.

GLASGOW, Wednesday.—Market firm, with fair business. Scotch done at 46s. 5½d. 46s. 9d., and 46s. 8d. cash, also at 46s. 11d and 46s. 9½d., one month; closing buyers at 46s. 7½d. cash, sellers ask ½d. more. Middlesbrough closes with buyers at 43s. cash, and 43s. 3d. one month, sellers ask 6d. more. Hematite closes with buyers at 54s. cash, and 54s. 3d. one month; sellers ask 3d. more.

WOLVERHAMPTON, Wednesday.—With the approach of Christmas rather more activity is observable, but business is not so brisk as it was at this time last year. Although there is plenty of work on old contracts new business appears to be held over. Marked bars are quoted at £8. 10s. to £9. 2s. 6d., according to brand, and galvanised sheets are quoted at £12. 17s. 6d. Cinder pigs are quoted at 42s. 6d., and part mines at 45s. to 47s. 6d.

MISCELLANEOUS CHEMICAL MARKET.

Bleaching powder holds a firm position, and there is now very little to be found in second hands. Prices during the week have been firm at £6. 12s. 6d. per ton on rails at makers' works, and there have been transactions recorded for 1891 at the same figure. Soda ash continues in good demand and prices are firm in various grades, from 1⅜ to 1 5/16 per deg. f.o.b. Caustic soda remains firm on the spot, but no business of consequence is being done for for forward deliveries. Chlorate of potash firm at 5½ per lb. Chlorate of soda scarce, and price 6¾ per lb. for January. Sulphur is scarce, and with a large amount of enquiry, makers are holding firmly for the advance recently gained. Business done over 1891 at £4. 10s. per ton, but some of the larger buyers are disposed to defer purchases for forward delivery. Sulphate of copper is still without any change, the business being only of limited character at £18. 15s. to £19. per ton f.o.b. Acetates of lime rather more plentiful, and prices easier. Acetic acids unchanged. Acetate of soda tends upward in value. Prussiate of potash still scarce, and price firm at 10d. for prompt delivery, 9¾ per lb. forward. Aniline products in brisk demand. Carbolic crystals still quiet, and prices are without movement.

THE LIVERPOOL COLOUR MARKET

Colours remain unaltered. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire common, 40s., medium, 50s., best, 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish. Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber, Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

THE TYNE CHEMICAL REPORT.

Tuesday.

There is little change to report in the chemical market this week, which, on the whole, continues quiet, with a limited amount of business doing as is usual at this time of the year. Bleaching powder is quiet, but makers ask full prices, although some second-hands are offering it at a reduction of half-a-crown a ton under Union prices. Caustic, soda ash, crystals and sulphate, all steady, without any alteration in prices.

The market prices of to-day are as follows:—

Bleaching powder, in softwood casks, £6. 15s. per ton; in hardwood casks, £7. per ton, both less 3½%. Caustic soda 77%, solid, in drums, £12. per ton, nett; ground and packed in 3-4 cwt. barrels, £16. per ton, nett; 70%, £11. 5s. per ton, less 3½%; white alkali, 1⅝d. per degree, less 5%; soda crystals, 56s. per

ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; ground and packed in casks 53s. per ton, both less 3½%; recovered sulphur, in 2 cwt. bags, £5, per ton, nett; chlorate of potash, 5½d. per lb., less 5%; silicate of soda, 75° Tw., £2. 15s. per ton; 100° Tw., £3. 10s. per ton; 140° Tw., £4. per ton; hyposulphite of soda. in 1 cwt kegs, £6. 10s. per ton; in 5-7 cwt. casks, £6. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £7. 15s. per ton; nitrate of baryta, crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton; carbonate of alumina, £27. 10s. per ton; aluminate of soda, £32. 10s. per ton; hydrate of barium, £8 10s. per ton. All f.o.b. Tyne or f.o.r. makers' works.

Northumberland small coals are still easy in price, ranging from 4s. 9d. to 6s. per ton, according to quality. Durham small continues steady at old prices, viz.: 6s. 6d. to 7s. 6d. per ton, delivered into craft.

The following is a list of chemicals exported from the Tyne during the month of November and corresponding period of last year.

	1890.	1889.
Alkali and soda ash	1,482 tons.	1,870 tons.
Bicarbonate of soda	—	2
Bleaching powder	1,701	1,708
Manure	10	111
Soda crystals	1,493	1,374
Sulphate of soda.....	445	77
Caustic soda.....	1,005	1,876
Other chemicals	1,389	
	7,525	7,018

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Furnace Flues for Steam Boilers. J. T. Milton. 19,007. November 24.
Photographic Shutters. G. H. P. Burne. 19,022. November 24.
Electric Switches. Woodhouse and Rawson United, Limited. 19,033. November 24.
Cleansing Air of Smoke and Fog. E. Oades. 19,044. November 24.
Application of Lactic Acid and its Salts in Colouring Matters. A. E. Delacroix. 19,046. November 24.
Gas Producing Apparatus for Thermal Motors. G. F. Redfern. 19,047. November 24.
Apparatus for Dressing Ores.—(Complete Specification.) C. Lührig and J. C. Cuninghame. 19,053. November 24.
Grinding and Crushing Machinery. W. H. Thompson. 19,061. November 24.
Sulphonated Thionines, and Dyestuffs therefrom. S. Pitt. 19,065. November 24.
Oxidising Linseed and other Oils. C. F. Leake, H. W. Godfrey, and C. E. Lucas. 19,066. November 24.
Refrigerating Apparatus.—(Complete Specification.) J. Erny and Z. T. Subers. 19,087. November 25.
Apparatus for the Manufacture of Sulphate of Ammonia. George Edward Davis and Alfred Roland Davis. 19,089. November 25.
Decorticating Textile Plants. G. E. N. I. E. Subra. 19,100. November 25.
Apparatus for Concentrating Solutions.—(Complete Specification.) J. A. Morrell. 19,110. November 25.
Steam Generators. W. Cooke. 19,115. November 25.
Packing of Chloride of Lime.—(Complete Specification.) T. Needham. 19,121. November 25.
Steam-boiler Water Gauges. J. Cameron. 19,137. November 25.
Secondary Batteries.—(Complete Specification.) H. H. Lake. 19,155. November 25.
Anti-Corrosive and Anti-Fouling Compounds.—(Complete Specification.) M. E. Dejouge. 19,160. November 25.
Electric Welding.—(Complete Specification.) M. W. Dewe. 19,162. November 25.
Reduction of Ores.—(Complete Specification.) H. W. Lash and J. Johnson. 19,163. November 25.
Reduction of Ores. J. Johnson 19,164. November 25.
Sulpho-acids of a red Basic Naphthalene Dyestuff. J. Y. Johnson. 19,167. November 25.
Extraction of Gold. J. B. Hannay. 19,181. November 25.
Water Guages J. A. Hopkinson and J. Hopkinson. 19,196. November 25.
Electrolytic Production of Thin Metal Tubes. L. Hausmann. 19,203. November 25.
Distillation of Coal and Recovery of Sulphate of Ammonia. H. C. Bull. 19,219. November 25.
Filters. C. H. Beloe and F. Candy. 19,200. November 26.
Electric Switches. H. Barton. 19,239. November 26.
Aerating Liquids by Liquid Carbonic Acid. R. Cox. 19,246. November 26.
Manufacture of Gunpowder G. G. André. 19,259. November 26.
Photographic Shutters A. S. Newman. 19,274. November 26.
"Chloridising Lime." J. C. Richardson. 19,316. November 27.
Smoke Consuming Fire Bridge. T. Dale. 19,318. November 27.
Manufacture of White Lead. Watson Smith, and W. Elmore. 19,323. November 27.
Photographic Apparatus. G. R. Miller. 19,327. November 27.
Colouring Matters from Gamma-amido-naphtholsulphonic Acid. S. Pitt. 19,330. November 27.
Steam Boiler Water Gauges. A. W. Tickle. 19,336. November 27.
Manufacture of Sheet or Plate Glass. H. R. Lumley. 19,340. November 27.
Manufacture of Glass Bottles. W. Ambler. 19,342. November 27.
Electrolysis. E. Placet and J. Bonnet. 19,344. November 27.
Extraction of Gold. J. A. Coombes. 19,349. November 27.
Crushing and Grinding Mills. W. H. Coward. 19,353. November 27.
Photographic Dishes. E. S. Norcombe. 19,358. November 28.
Wool Washing Machinery. W. Tattersall. 19,359. November 28.
Wool Drying Apparatus. " 19,360. " "
" " " " 19,362. " "
Recovery of Glycerine, etc., from Soap Makers' Waste Lye. J. Taylor. 19,382. November 28.
Manufacture of Ammonium Chloride and Calcium Sulphate. 19,390. M. N. d' Andria. November 28.
Electric Meters.—(Complete Specification.) E. Hartmann and W. Braun. 19,406. November 28.
Electrolytic Production of Gases. E. A. Ducretet. 19,423. November 28.
Fluid Meters.—(Complete Specification.) L. H. Nash. 19,443. November 28.
Manufacture of Coke and Lye Products. F. J. Jones. 19,501. November 28.
Production of Sulphonic Acids and Sulphones from Mineral Oils, and Manufacture of a New Product for Treating Gelatinous Matters with Sulphonic Acid. A. M. Clark. 19,502. November 28.

Gazette Notices.

PARTNERSHIPS DISSOLVED.

MELLERSH AND JOLLIFFE, Crutched-Friars, London, E.C., chemical manufacturers and dealers in chemicals and manures.
F. BALL and L. H. LLOYD, under the style of Lloyd and Co., Nottingham, brick and tile merchants.
G. SMITH AND W. TAYLOR, Prees, artificial manure manufacturers.
T. SCHOFIELD, J. SCHOFIELD, J. W. SCHOFIELD AND J. A. SCHOFIELD, under the style of Joshua Schofield and Sons, Cornbrook, nr. Manchester.
H. M. CARTER, T. CARTER AND C. CARTER, under the style of Carter and Sons, Wakefield, brewers; and under the style of Carter and Co., Wakefield and elsewhere, maltsters.
J. AND J. BUTTERWORTH, Wardle, near Rochdale, brewers.
H. MILLS AND J. MILLS, Malt Street, Old Kent Road, London, brewers.

THE BANKRUPTCY ACT, 1883.

Adjudications.

CAMPBELL, NEILL EDWARD, trading as Campbell and Co., late of Holloway Road, and Arthur Road, Holloway, London, mineral water manufacturer.

Receiving Orders.

BROWN, WILLIAM LAX CAVE, trading as W. L. C. Brown and Co., Manchester and Romily, india-rubber manufacturer.

Orders made on Applications for Discharge.

HORNER, JAMES READ, Salterhebble, nr. Halifax, chemical manufacturer—discharge suspended till May 5th, 1891, and then granted.
PRATT, HENRY JAMES, York, chemist and druggist—discharge granted forthwith.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending November 29th.

Antimony Ore—

France,	17 t.	H. Merton & Co.
Spain,	7	B. Kuhn
Singapore,	50	Pillow, Jones, & Co.

Antimony Ore—*continued.*

Sydney,	21	Bk. of N. S. W.

Acetic Acid—

Holland,	£167.	Rosenburg, Loewe, & Co.
"	68 pks.	Hernu, Peron, Co.
"	17	A. & M. Zimmermann

Alum—

Holland,	73 pks.	Ohlenschlager Bros.

Barytes—

Germany,	24 cks.	O'Hara & Hoar
Belgium,	20	W. Harrison & Co.
Germany,	23	"
"	46	D. Storer & Sons

Barytes—*continued.*

Belgium,	29 cks.	Leach & Co.
Germany,	11	H. Lambert
"	24	O'Hara & Hoar

Borax—

Germany,	£56.	F. Stahlschmidt & Co.

Barium Chloride—

Germany,	£25.	Petri Bros.

Brimstone—
Italy, 17½ t. J. Kitchen, Ltd.
" 10 S. Boor & Co.
" 300 W. C. Bacon & Co.
" 200 Anderson, Anderson, & Co.

Bones—
E. Indies, 354 t. Goune, Croft, & Co.
Sydney, 7 Contl. Bkg. Co. of Sydney
Aden, 8 Culverwell, Brooks, & Co.
Brisbane, 18 Goad, Rigg, & Co.

Copper Ore—
Spain, 15 c. B. Kuln

Cream of Tartar—
France, 4 pks. T. Ronaldson & Co.
" 4 B. & F. Wf. Co., Ld.

Charcoal—
Sweden, 819 bgs. J. Hall & Son

Caoutchouc—
Penang, 63 c. T. Merry & Son
Singapore, 24 Kleinwort, Sons, & Co.
" 400 J. Kenyon & Sons
" 2 R. & J. Henderson
France, 170 Stiebel Bros.
Madagascar, 77 Prop. Bull's Wf.

Caustic Soda—
Holland, 400 c. J. Owen

Chemicals *(otherwise undescribed)*
Germany, £440. A. & M. Zimmermann
" 58 W. Burton & Sons
Holland, 20 H. Boyce
" 20 Phillipps & Graves
U. States, 300 L & I. D. Jt. Co.
Germany, 610 A. & M. Zimmermann
" 5 Phillipps & Graves

Dyestuffs—
Madders
N. Russia, 34 pks. Ross & Deering
Argols
Italy, 220 B. Jacob & Sons
Myrabolams
E. Indies, 500 pks. Elkan & Co.
" 1,000 W. Shelcott
Anthracene
France, 44 cks. Burt, Boulton, & Co.
Logwood
B. W. Indies, 30 t. T. Hankey & Co.
" 19 S. Dobree & Sons
Jamaica, 29 L. & I. D. Jt. Co.
Valonia
Smyrna, 76 t. S. Barrow & Bros.
" 50 Adams Bros.
Turkey, 60 Hicks, Nash, & Co.
Alizarine
Holland, 50 pks. J. Forsey
Orchella
E. Indies, 13 E. Barbur & Co.
Saffron
Spain, 1 pkg. Price, Hickmann, & Co.
Annatto
Ceylon, 150 Hoare, Wilson, & Co.
E. Indies, 158 "
Tanners' Bark
U. States, 16½ t. G. B. Mackereth
Belgium, 5 Hicks, Nash, & Co.
" 26 Leach & Co.
" 10 T. H. Lee
" 12 L. & N. W. Rly. Co.
Fustic
Germany, 3 Churchill & Sim
B. W. Indies, 8 Park, Macfadyen, & Co.
Gambier
E. Indies 226 bgs. Beresford & Co.
" 325 bls. Elkan & Co.
" 503 Adamson, Gilfillan, & Co.
" 858 W. H. Cole & Co.
Germany, 84 H. Lambert
Singapore, 84 "
" 368 Beresford & Co.
" 206 D. C. Thomas & Sons
" 1,710 R. & J. Henderson
" 641 W. H. Cole & Co.
" 347 T. J. & T. Towell
" 854 pks. Adamson, Gilfillan, & Co.
" 471 J. H. & G. Scovell
Indigo
E. Indies, 15 chts. L. & I. D. Jt. Co.
" 61 "
" 4 Stansbury & Co.
Holland, 8 W. Johnston & Co.
Sweden, 1 Schenker & Co.
Sumac
Italy, 60 bgs. Ross & Deering
" 130 pks. L. & N. W. Rly. Co.

Dyestuffs—*continued.*
Italy, 1,000 pks. W. Schcott
" 50 W. Johnson & Sons
" 1,000 Brown & Elmslie
" 300 J. Kitchen, Ltd.
" 200 Bailey & Leetham
Cochineal
Canaries, 4 bgs. Swanston & Co.
" 8 H. R. Toby & Co.
" 5 Johnson, Rolls, & Co.
" 8 Forward Brs. & Co.
" 12 Bruce & White
Germany, 7 pks. Craven & Co.
Teneriffe, 16 F. Huth & Co.
Granilla
Canaries, 5 bgs. Swanston & Co.
Sassafras
U. States, 23 bls. Bryant & Aitkens
Extracts
Belgium, 150 cks. L. J. Levinstein & Sons
" 148 "
France, 325 pks. "
" 50 "
Austria, 244 A. J. Humphrey & Co.
France, 25 L. J. Levinstein & Sons

Glucose—
Germany, 37 pks. 200 cwts. M. D. Co.
" 34 306 J. Knill & Co.
" 55 440 R. G. Hall & Co.
" 100 120 H. A. Litchfield & Co.
U. States, 100 550 P. W. Hore
" 500 500 Barrett, Tagant & Co.
" 75 455 T. M. Duch & Sons
" 180 780 R. G Hall & Co.
" 50 279 T. C. Howell
Germany, 800 800 J. Barber & Co.
" 35 240 Proprs. Chmblns. Wf.
" 25 200 Pillow, Jones & Co.
Holland, 135 172 Proprs. Sun Wf.
U. States, 300 1,680 Union Ligtherage Co.
Germany, 23 180 M. D. Co.
Holland, 50 50 J. Barber & Co.
Germany, 25 203 Pillow, Jones & Co.
" 35 290 J. Knill & Co.
" 600 600 Baxter & Hoare
U. States, 50 300 Proprs. Scott's Wf.

Gutta Percha—
Singapore, 92 c. R. & J. Henderson
Penang, 44 L. & I. D. Jt. Co.
France, 40 Flageollet & Co.
Singapore, 194 Kattenbach & Schmitz
Hong Kong, 17 Rehder & Co.

Guano—
S. Pacific, 200 t. Anglo-Contntl. G. Wks.

Glycerine—
Germany, £82 W. Balchin
" 150 H. J. Perlbach & Co.
Holland, 20 J. L. Lyon & Co.
" 60 Carey & Sons

Isinglass—
U. States, 5 pks. W. M. Smith & Sons
Russia, 4 M. D. Co.
E. Indies, 7 L. & I. D. Jt. Co.
" 48 Clarke & Smith
" 8 "
" 3 Brookes & Green
Penang, 7 L. & I. D. Jt. Co.
Singapore, 7 "

Manure—
Montreal, 119 t. Ang-Contntle. G. Wks.
Germany, 25 Scrutton, Sons & Co.
Phosphate Rock
U. States, 2,303 t. Wyllie & Gordon

Naphtha—
Holland, 107 crbys. Lister & Biggs
Belgium, 17 drms. Stein Bros.
France, 66 cks. Burt, Boulton & Co.
Germany, 14 E. Wood.

Pyrites—
Spain, 3,046 t. C. Tennant, Sons & Co

Plumbago—
Ceylon, 175 cks. T. Thredder, Son & Co.
Holland, 245 brls. "
Germany, 24 cks. T. H. Lee
" 24 Prop. Scott's Wf.

Pitch—
Germany, 100 brls. Sieveking, Droop & Co.
Holland, 24 Thames S. T. & Ltrge. Co.
Germany, 100 cks. Sieveking, Droop & Co.
" 56 brls. Scrutton, Sons & Co.

Paraffin Wax—
U. States, 111 brls. G. H. Frank
" 229 H. Hill & Sons
" 2,337 J. H. Usmar & Co.
" 89 G. H. Frank

Potassium Carbonate—
France. 11 pks. J. A. Reid

Potassium Sulphate—
Holland, 60 pks. A. & M. Zimmermann
France, 200 F. T. Potts & Co.
Germany, 508 J. Jensen & Co. Ld.
" 508 H. J. Perlbach & Co.
France, 17 Weatherley, Mead & Co.
" 45 "

Pearl Ashes—
France, 200 c. F. W. Berk & Co.

Saltpetre—
Germany, 48 bgs. J. Hall & Son
" 72 Moore & Hole
E. Indies, 810 Lucas & Spencer's Wf. Ld.
Germany, 118 cks. P. Hecker & Co.
" 100 T. Merry & Son
E. Indies, 469 bgs. Co-op. Ltge. Ascn. Ld.
" 490 Lucas & Spencers

Stearine—
Germany, 3 cks. W. Balchin
Belgium, 63 bgs. H. Hill & Sons

Salammoniac—
Holland, £100. Barr, Moering & Co.

Sodium Acetate—
France, 16 pks. Prop. Hay's Wf.

Sodium Nitrate—
Peru, 11,562 bgs. Ang. Cent. G. Wks.

Tar—
Spain, 2 cks. Burt, Boulton & Co.

Turpentine—
U. States, 1,140 brls. H. Hill & Sons

Ultramarine—
Holland, 8 cs. Haeffner & Co.
Belgium, 10 cks. Arnati & Harison
Holland, 20 Hernu, Peron & Co.
Germany, 40 cs. G. Steinhoff
Holland, 40 pks. Ohlenschlager Bros.
" 5 A. Zumbeck & Co.
" 4 cks. Spies, Bros. & Co.
Belgium, 10 pks. W. Harrison & Co.
Germany, 20 cs. G. Steinhoff

Verdigris—
France, 1 ck. C. Brumlen

Zinc Oxide—
Holland, 25 brls. Beresford & Co.
" 40 M. Ashly, Ld.
" 51 "
" 7 Robinson, Roberts & Co.

LIVERPOOL.

Week ending Dec. 2nd.

Ammonia—
New York, 50 pks. Simpson, Morrow & Co.

Acetic Acid—
Rotterdam, 6 bllns.

Antimony Ore—
New Orleans, 150 sks. J. Lewis & Co.

Barytes—
Antwerp, 6 cks.
Rotterdam, 42 cks.

Bones—
B. Ayres, 560 t.
" 219

Bone Ash—
B. Ayres, 361 t.

Camphor—
Hamburg, 1 cs. 1 ck.

Copper Ore—
Pisco, 209 bgs. M. Picasso Hos.
Kragero, 163 bxs. Richardson & Co.

Cream of Tartar—
Rotterdam, 6 cks.

Caoutchouc—
Pernambuco, 53 brls. Powell & Sing

Caoutchouc—*continued.*
Manaos, 44 cs. G. Potey, Robert & Co.
" 28 R. Singlehurst & Co.
" 22 J. Lilly & Sons
" 24 W. Carden & Co.
" 59 F. Suarer & Co.
" 28 P. J. Foulkes & Co.
" 739 "
Para, 214 F. Suarer & Co.
" 1,218 "
Brazil, 135 "
" 15 Bieber & Co.
" 5 Gunston, Sons, & Co.
" 11 W. Hooton & Yates
" 660 "
Ceara, 8 brls.
Colon, 9 T. M. Williams

Dyestuffs—
Valonia
Syra, 210 bgs. Barff & Co.
Smyrna, 7 50 t. Barry Bros.
" 120 Essayan, Shahum & Co.
" 600 147½ "
Madders
Smyrna, 21 bgs.
Fustic
Savanilla, 1,322 bgs. G. H. Muller & Co.
" 880 "
" 1,901 G. H. Muller
Vera Cruz, 1,873 B. Graham & Co.
" 1,471 R. B. Watson & Co.
Extracts
Colon, 50 cs. E. Chesney & Co.
Antwerp, 10 cks.
Annatto
Bordeaux, 1 cs.

Glycerine—
Bordeaux, 40 cks.
Marseilles, 20 W. Hart
Rotterdam, 1 ck. "
" 3 cs. 6 blls.
Bordeaux, 41 "

Glucose—
Stettin, 50 bgs.

Horn Piths—
B. Ayres, 39 t. Williamson, Milligan & Co.

Iodine—
Valparaiso, 149 brls. A. Gibbs & Sons
" 9 San Sebastian & Co.
" 73 W. & J. Lockett

Litharge—
Rotterdam, 7 cks.
" 11 "

Potash Salts—
Hamburg, 977 bgs.
" 610 "

Pitch—
Rotterdam, 10 cks.
" 55 "

Phosphates—
Ghent, 2,634 bgs.
Montreal, 100 t. W. Hunter & Co.

Pyrites—
Huelva, 1,463 t. Tennants & Co.

Sugar of Lead—
Rouen, 12 cks.
Hamburg, 4

Sulphur Ore—
Huelva, 1,520 t, Matheson & Co

Salt—
B. Ayres, 5 cs.

Stearine—
Antwerp, 38 bgs.
Rotterdam, 30

Saltpetre—
Hamburg, 159 cks.

Soap—
Rotterdam, 25 cs.

Tartar—
Bordeaux, 1 ck.

Ultramarine—
Rotterdam, 8 cks.
" 8 "
Hamburg, 30

Verdigris—
Bordeaux, 7 cks.
Marseilles, 10 J. A. M. Bird & Co.

Waste Salt—
Hamburg, 508 bgs.
,, 609,600 ko.
White Lead—
Antwerp, 15 cks.
Hamburg, 4
Zinc Oxide—
Antwerp, 25 cks. 195 brls.
Rotterdam, 25
Zinc Ash—
Hamburg, 115 cks.

GLASGOW.

Week ending December 4th.

Barytes—
Antwerp, 202 bgs.
Rotterdam, 294 cks.
,, 22
Borax—
Rouen, 40 cks.
Cobalt Ore—
Huelva, 1,440 t. Tharsis Co., Ltd.
Chemicals *(otherwise undescribed)*
Rotterdam, 1 cs. J. Rankine & Son
Hamburg, 2 3 cs.
Dyestuffs—
Alizarine
Rotterdam, 35 cks. 2 cs.
,, 80 1
,, 177
Extracts
Antwerp, 22 cks.
Dyestuffs *(otherwise undescribed)*
Hamburg, 1 ck.
Amsterdam, 25 cks.
Rotterdam, 5 J. Rankine & Son
Glycerine—
Rotterdam, 2 cks. 9 cs. J. Rankine & Son
Pitch—
Antwerp, 11 cks.
Rouen, 4
Potassium Prussiate—
Hamburg, 16 cks.
Sulphur—
Antwerp, 21 brls.
Sulphur Ore—
Seville, 220 t. Seville Sulphur Co.
Drontheim, 150 t.
Sodium Acetate—
Rouen, 10 cks.
Ultramarine—
Antwerp, 20 cs.
Rotterdam. 5 J. Rankine & Son
Waste Salt—
Hamburg, 2,003 bgs.
,, 2,032
Zinc Oxide—
Rotterdam, 25 cks. J. Rankine & Son

GRIMSBY.

Week ending November 29th.

Albumen—
Hamburg, 10 pks.
Chemicals *(otherwise undescribed)*
Hamburg, 3 pks.
Dyestuffs *(otherwise undescribed)*
Hamburg, 20 pks.
Zinc Ashes—
Antwerp, 28 pks.

GOOLE.

Week ending November 26th.

Antimony—
Boulogne, 1 ck.
Dyestuffs—
Madders
Rotterdam, 4 cks.
Alizarine
Rotterdam, 10 cks.
Dyestuffs *(otherwise undescribed)*
Boulogne, 195 cks. 11 cs. 4 pks.
Glucose—
Dunkirk, 200 bgs.
Calais, 400
Potash—
Dunkirk, 22 cks.
Calais, 49 brls.
Phosphate—
Ghent, 1,000 bgs.
Plumbago—
Boulogne, 1 ck. 1 cs.
Saltpetre—
Hamburg, 250 kgs. 6 brls.
Sodium Silicate—
Rotterdam, 6 cks.
Waste Salt—
Hamburg, 233 t. 1,194 cks.

HULL.

Week ending December 4th.

Albumen—
Rouen, 11 cks. Rawson & Robinson
Acids *(otherwise undescribed)—*
Rotterdam, 36 pks. W. & C. L. Ringrose
Bones—
En Senada, 245 t.
Bremen, 5 bgs J.. Pyefinch & Co.
Bone Ash—
En Senada, 388 t.
Barytes—
Antwerp, 39 cks. 80 bgs. Bailey & Leetham
Bremen, 19 cks. Blundell, Spencer, & Co.
Chemicals *(otherwise undescribed)*
Dunkirk, 38 pks. Wilson, Sons, & Co.
Danzig, 8 cks.
Marseilles, 10 Wilson, Sons, & Co.
Riga, 136 pks. ,,
Copenhagen, 1 ,,
Bremen, 1 kg.
Rotterdam, 1 ck. W. & C. L. Ringrose
Caustic Potash—
Antwerp, 2 drms.
Dyestuffs—
Madders
Rotterdam, 1 ck.
Alizarine
Rotterdam, 20 cks. Hutchinson & Son
,, 25 ,,
,, 45 ,,
,, 26 ,,
Dyestuffs—
Indigo
Amsterdam, 1 cht. 32 pkgs.
Sumac
Marseilles, 150 bgs. Wilson, Sons, & Co.
Glucose—
Rotterdam, 20 bgs. G. Lawson & Sons
Harlingen, 200
Stettin, 800 C. M. Lofthouse & Co.
,, 700
New York, 20 brls.
Stettin, 26 cks. Wilson, Sons, & Co.
Rotterdam, 90 bgs. Hutchinson & Son
Glycerine—
Dunkirk, 20 drms. Wilson, Sons, & Co.
Amsterdam, 5 dms.
Graphite—
Rotterdam, 5 cks. G. Buckton & Son
Manure—
Ghent. 101 t.
Phosphate—
Ghent, 10 t. Wilson, Sons, & Co.
Phosphorus—
Rouen, 10 cs. Wilson, Sons, & Co.
Plumbago—
Hamburg, 52 brls. G. Buckton, & Sons
Pyrites—
Huelva, 1,490 t. J. Dalton, Holmes, & Co.
Soap—
Marseilles, 20 cs. Wilson, Sons, & Co.
New York, 413 pks. Wilson, Sons, & Co.
Saltpetre—
Hamburg, 12 kgs. Bailey & Leetham
Soda—
Rotterdam, 200 kgs. W. & C. L. Ringrose
Stearine—
Antwerp, 15 bgs. Wilson, Sons, & Co.
Turpentine—
Libau, 67 brls.
White Lead—
Rotterdam, 3 cks. G Lawson & Sons
,, 17 Hanger, Watson, & Harris
,, 17 A. Sanderson & Co.
,, 20 Sizions, Bros., & Co.

TYNE.

Week ending December 3rd.

Alum Earth—
Hamburg, 36 cks. Tyne S. S. Co.
Barytes—
Antwerp, 50 bgs. Tyne S. S. Co.
Rotterdam, 41 cks. ,,
Glucose—
Hamburg, 25 cks. Tyne S. S. Co.
Rotterdam, 100 bgs. ,,
Pyrites—
Huelva, 1,946 t. Scott Bros.
Sulphur Ore—
Pomaron, 1,200 t. Mason & Barry, Ltd.
Salt—
Hamburg, 140 t. 500 bgs.
Zinc Oxide—
Antwerp, 45 brls. Tyne S. S. Co.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Nov. 26th.

Albumen—			
New York,	2 t.	5 c.	£153
Arsenic—			
Melbourne,	10 t.		£161
Algoa Bay,	1	10 c.	24
Amsterdam,		6 brls.	17
Ammonia—			
Rotterdam,		11 drs.	£16
Hamburg,		20	35
Alum Cake—			
Calcutta,	18 t.	7 c.	£80
Ammonium Sulphate—			
Demerara,	9 t.	7 c.	£116
Bordeaux,	50	16	565
Valencia,	200		2,400
Halifax,		10	30
Valencia,	20	2	259
Ammonium Carbonate—			
Oporto,	1 t.	2 c.	£26
Bordeaux,	1	14	50
Acids *(otherwise undescribed)—*			
New York,		25 cs.	£70
Havre,		2	10
Trinidad,		10 pks.	16
Alum—			
Batoum,	9 t.	7 c.	£55
Barytes Chlorate—			
New York,		4 c.	£16
Bone Meal—			
Natal,	10 t.		£65
Borax—			
Melbourne,	2 t.	5 c.	£115
Borax—*continued.*			
Rotterdam,		9 c.	10
Brisbane,	1 tank		57
Brimstone—			
Brisbane,		20 brls.	£19
Coal Products—			
Alizarine			
Boston,		20 cks.	£319
Bombay		34	251
Aniline			
Rangoon,	5 cs.	100 drs.	£79
Calcutta,	14 cks.		17
Naphthaline			
Riga,	4 cks.		£8
Le Treport,	34		52
Genoa,	1		12
Hamburg,		108 pks.	109
Rotterdam,	10		10
Benzole			
Rotterdam,	33 pns.		£850
Terneuzen,		40 drs.	725
,,		20 cks.	358
Rotterdam,	29		470
,,	20		438
Terneuzen,		8	201
Anthracene			
Rotterdam,		128 cks.	£850
,,		46	400
,,		216	2,371
,,		97	82
Dusseldorf,		49	340
Pitch			
Cape Town,		20 cks.	£10
Hamburg,		8	18
Genoa,	2,302 t.		3,741
Dunkirk,	281		478
New York,		250	170
Boston,		1,000	438
Alexandria,		200 brls.	64
Coal Products—*continued*			
Tar			
Melbourne,		335 drs.	£73
Hong Kong,	30 pks.		31
Algoa Bay,		250	12
Cape Town,		5 cks.	18
M. Video,		30 brls.	24
Calcutta,		25	15
Naphtha			
Melbourne,	1 t.		£40
Sydney,		30 drs.	16
Singapore,		50	38
Le Treport,	10		400
Calais,		2 cks.	12
Dunedin,		10	9
Copper Sulphate—			
Genoa,	118 t.	15 c.	£2,105
Adelaide,	10		190
Lyttelton,		10	10
Citric Acid—			
Hamburg,		5 c.	£35
Santander,		1	7
Amsterdam,		1	7
Hamburg,	4 kgs.		31
Stettin,		5	36
Oporto,	2 cks.	4	45
Calcutta,	1 cs.		4
Reval,		35	262
Cream of Tartar—			
E. London,		2 c.	£14
Canterbury,		3	17
Melbourne,		2	192
Canterbury,		8	42
Adelaide,		9	44
Brisbane,		10	55
Canterbury,		5	28
Launceston,		5	25
Brisbane,	1 t.	5	131
Caustic Soda—			
Malta,		11 c.	£12
Auckland,	1 t.	2	11
Algoa Bay,		8	11
Canterbury,	8	9	97
Carbolic Acid—			
Kingston,	1 t.	2 c.	£33
Singapore,		25 drs.	10
Cape Town,		1 cs.	18
Yokohama,		20	91
Copperas—			
Larache,	11 t.	3 c.	£28
Charcoal—			
Ghent,	10 t.	4 c.	£50
Hamburg,	20	18	100
Chemicals *(otherwise undescribed)*			
E. London,	27 pks.		£15
Dunedin,		20 kgs.	96
Hiogo,		17 cs.	274
Adelaide,	43		54
Melbourne,		3	63
Sydney,		5	144
Montreal,	4		40
Seville,		4	29
Limon,	13		58
Disinfectants—			
Calcutta,	126 pks.		£86
Sydney,		20 cks.	33
,,		17 cs.	38
Trinidad,	12		34
Brisbane,		14	38
,,		12 drs.	14
Guano—			
Demerara,	67 t.	10 c.	£680
Jamaica,	8	1	29
,,	34	19	200

Hypophosphate of Lime—
New York, 3 c. £33
Hydro Carbon—
Ghent, 34 cks. £42
Brussels, 1 t. 17
Insect Powder—
Calcutta, 2 cs! £17
Algoa Bay, 1 17
Manure—
Valencia, 15 t. £120
Tarragona, 7 4 c. 61
Alicante, 16 1 86
Launceston, 10 130
Hobart, 10 130
Barbadoes, 15 127
St. John, N.B., 10 t. 42
Bordeaux, 101 600
Oxalic Acid—
Sydney, 4 cks. £14
Potassium Hypophosphate—
New York, 2 c. £28
Phosphoric Acid
Brisbane, 2 t. 14 c. £50
Demerara, 4 65
Potash Crystals—
New York, 3 t. 12 c. £172
Phosphorus—
Yokohama, 5 cs. £34
Oporto, 10 c. 100
Melbourne, 10 68
Potassium Cyanide—
Townsville, 3 c. £15
Shanghai, 4 30
Potash Salts—
Natal, 170 cs. £1,870
Potassium Iodide—
Genoa, 2 cs. £70
Potash—
Gothenburg, 5 kgs. £12
" 5 12
Potassium Prussiate—
Halifax, 3 c. £14
Phosphate—
Oporto, 31 t. £50
Sodium Hypophosphate—
New York, 3 c. £33
Strontium Carbonate—
New York, 6 c. £13
Sodium Bicarbonate—
Brisbane, 10 c. £8
Soda Salts—
New York, 3 t. 13 c. £35
" 3 12 40
Strontium Nitrate—
New York, 5 t. £143
Soda Ash—
Fremantle, 5 t. 4 c. £33
Saltpetre
Gibraltar, 23 t. £506
Monte Video, 17 c. 18
Leghorn, 2 1 43
Oporto, 3 4 45
Sydney, 1 24
Adelaide, 2 43
Jersey, 5 2 100
Rio de Janeiro, 2 9 55
Canterbury, 1 5 28
Gibraltar, 5 110
Brisbane, 2 44
Launceston, 10 12
Salammoniac—
Cape Town, 5 c. £11
Ibrail, 14 23
Galatz, 1 t. 6 43
Constantinople, 2 10 88
" 1 10 50
Salonica, 2 2 75
Sheep Dip—
Algoa Bay, 1 t. 12 c. £67
" 300 drs. 102
Falkland, 27 62
Algoa Bay, 3 t. 5 185
San Salvador, 140 drs. 189
Spring Point, 20 cs. 40
San Carlos, 43 pks. 10 drs. 203
E. London, 50 cs. 140
Sulphuric Acid—
Natal, 3 t. £40
Aden, 2 11
Sydney, 13 drs. 16
Aden, 10 cs. 10
Madras, 10 10
Superphosphate—
Halifax, 17 t. £51
Sodium Sulphate—
Ghent, 50 t. £50
" 50 50
" 75 75
Silver Nitrate—
Hamburg, 1 cs. £50
Sulphur—
Brisbane, 10 cs. £7
Tartaric Acid—
Canterbury, 9 c. £64
Sydney, 30 kgs. 194
Adelaide, 10 71
Brisbane, 10 71

LIVERPOOL.

Week ending November 29th.

Alkali—
Rotterdam, 22 cks.
Boston, 74 tcs.
Arsenic—
Syra, 5 t. £70
Ammonium Nitrate—
Victoria, 8 t. 13 c. £700
Ammonium Muriate—
B. Ayres, 1 t. 19 c. £7
Santander, 10 15
Calcutta, 6 7
Bilbao, 8 1 q. 10
Ammonium Carbonate—
Rottetdam, 1 t. 3 c. £38
Genoa, 1 11 1 q. 51
Leghorn, 1 5 3 42
Odessa, 1 18 65
Stockholm, 6 1 11
Odessa, 1 3 34
Hamburg, 6 10
Philadelphia, 25 13 3 584
Portland, 1 32
Ammonium Sulphate—
Hamburg, 50 t. £603
Antwerp, 100 6 c 2 q. 1,150
Demerara, 80 17 3 991
Bordeaux. 15 5 1 177
Demerara, 87 5 1,046
Ghent, 20 230
Bordeaux, 41 482
New York, 51 6 617
Hamburg, 50 3 3 550
Bordeaux, 10 3 118
Alum—
Constantinople, 1 t. 1 c. £5
Calcutta, 25 2 132
Santos, 19 5
Seville, 3 10 19
Larnaca, 1 4 6
Lisbon, 1 7 7
Melbourne, 6 32
Montreal, 14 12 74
Syra, 2 19 15
Bari, 18 1 q. 5
Vigo, 3 10 18
Pernambuco, 1 6
Dunedin, 2 2 3 7
Bombay, 14 19 44
Larnaca, 1 4 7
Boston, 2 14 3 18
Brimstone—
Calcutta, 8 t. 3 c. 2 q. £43
Bones—
Stockholm, 29 t 4 c. 2 q. £285
Borax—
Demerara, 3 c. £5
Malaga, 11 16
M. Video, 4 90
Rosario, 2 t. 10 69
Bleaching Powder—
Baltimore, 84 tcs. 334 cks.
Boston, 196 536
Calcutta, 15 cs.
New York, 201
Oporto, 4 brls.
Pasages, 12
Rio de Janeiro, 5
Baltimore, 93
Boston, 445 88 tcs.
Chicago, 16 pks.
New York, 190
Rouen, 49
San Sebatsian, 14
Terneuzen, 25
Trieste, 31
Borate of Lime—
Rotterdam, 10 t. 1 c. 3 q. £110
Copperas—
Constantinople, 14 t 5 c. £30
Smyrna, 3 6 7
Alexandria, 6 15 14
Larnaca, 1 18 1 q. 5
Copper Sulphate—
Genoa, 2 t. 3 c. 2 q. £41
Corunna, 2 1 37
Fiume, 4 17 3 89
Ancona, 6 2 2 120
Bilbao, 24 17 3 448
Monte Video, 14 12
Trieste, 4 19 2 91
Leghorn, 1 1 2 19
Copper Sulphate—*continued.*
Syra, 1 t. 10 c. 1 q. £27
" 12 13 1 230
Venice, 18 17 3 247
B. Ayres, 1 18
Odessa, 1 2 20
Venice, 10 2 186
Genoa, 20 4 351
Alexandria, 1 3 3 22
Genoa, 112 7 1 2,038
Rotterdam, 2 3 3 38
" 2 1 36
Barcelona, 4 17 3 92
Leghorn, 3 4 2 90
Bordeaux, 50 3 920
Venice, 9 10 1 171
Kurrachee, 1 18
Monte Video, 1 10 18
Genoa, 26 19 2 476
Blibao, 14 19 1 256
Venice, 1 15 21
Caustic Soda—
Alexandria, 15 drms.
Amsterdam. 40
Batoum, 95
Beyrout, 62
Boston, 200
Brisbane, 30
Catania, 40
Corfu, 25
La Guayra, 20
Leghorn, 36
Malaga, 125 pks. 50
Napanee, 10
Naples, 63
Odessa, 200
Puerto Cabello, 10
Rosario. 20
San Francisco, 100
Santander, 14
Algoa Bay, 15 bxs. 14 cs.
Amsterdam, 205
Antwerp, 27 brls.
Batoum, 50 sks.
Bombay, 18
Boston, 300
Brisbane, 7
B. Ayres, 10
Calcutta, 90
Cape Town 4
Chicago, 50 pks.
E. London, 10 bxs.
Galatz, 30
Genoa, 40
Leghorn, 15
Lisbon, 56
Maceio, 2
Melbourne, 34
Montreal, 25 cks.
Naples, 33
New Orleans, 442
New York, 50 pks. 625
Norrkoping, 34
Nuevitas, 19
Odessa, 100
Portland, 60
Puerto Cabello, 51
Rangoon, 4
Santander, 10
Seville, 40
Singapore, 80 t.
Stockholm, 30
Sydney, 12
Carbolic Acid—
Hamburg, 1 t. 5 c. 3 q. £90
Cape Town, 3 152
New York, 5 10 1 412
Havre, 10 117
Portland, 15 10
Marseilles, 17 3 2 1,122
Montreal, 10 27
Caustic Potash—
Mollendo, 18 c. £27
" 18 27
Sydney, 2 t. 2 51
Melbourne, 6 4 156
Disinfectants—
Cadiz, 9 c. 1 q. £45
Epsom Salts—
Lisbon, 10 brls.
Malaga, 20
Constantinople, 2 cks.
Rio de Janeiro, 100 kgs.
Iodine—
Seville, 15 lbs. £9
Magnesia—
Frontera, 4 cs.
Havana, 30
Manure—
Victoria, 1 t. 14 c. £65
Oxalic Acid—
Syra, 1 t. 13 c. 1 q. £65
Pitch—
New York, 1,613 bgs.
Phosphorus—
B. Ayres, 2 c. 3 q. £26
Potassium Prussiate—
Bilbao, 2 c. £9
Potash—
Canada, 15 c. 1 q. £12
Montreal, 1 4 1 70
Santander, 1 1 1 25
Potassium Chlorate—
Catania, 10 c. £23
New York, 10 t. 467
" 7 5 362
" 10 467
Sydney, 2 4 1 q. 95
Hamburg, 1 43
New York, 7 10 315
Santos, 2 93
Picric Acid—
Pasages, 1 c. £1
Potassium Bichromate—
Piræus, 1 t. 4 c. £43
Santos, 20 cks. 105
Soap—
Accra, 50 bxs.
Antwerp, 400 cs.
Assinee, 20
Axim, 25
Boston, 1 ck. 1
Cameroons, 50
Cape Town, 40
Christiania, 216 25 pks.
E. London, 1,000
Gibraltar, 250
Ibo Ibo, 1
Lisbon, 1
M Video, 4
Rotterdam, 50
St. Johns. N.F., 15
St. Thomas, 50
San Francisco, 2 cks
Toronto, 100
Trinidad, 13
Trixillo, 301 bdls.
Alexandria, 20
Amsterdam, 50
Belize, 80
Bombay, 242
Brass, 160
Carthagena, 105
Colombo, 16
Constantinople, 20 20
Corruna, 40 brls.
E. London, 3
Grenada, 100
Hong Kong, 101
Kurrachee, 148
Madeira, 1 cs
New Orleans, 200
Old Calabar, 700
Sierra Leone, 458
Surnham, 50
Calcutta, 10 3
Cape Coast, 4 cs.
Sodium Silicate—
Carthagena, 9 cks
Lisbon, 10
Melbourne, 42
Sydney, 42
Victoria, B.C., 32
Lyttelton, 5 brls.
Soda Crystals—
Constantinople, 175 brls.
Iquitos, 50
Demerara, 30
Malta, 50
Philadelphia, 375 kgs.
Smyrna, 60
Varna, 20
M. Video, 14
Salt—
Amsterdam, 64 t.
Antwerp, 330
Baltimore, 380
Barbadoes, 16¾
Black Point, 5
Boma, 9
Belize, 131
B. Ayres, 17½
Calcutta, 1,196
Cameroons, 55
Cape Lopez, 15
Copenhagen, 331
Ghent, 113
Indianapolis, 70
Landana, 7
New Orleans, 550
New York, 70
Portland, 100
Port Natal, 1½
Rio de Janeiro, 50 cs
Rosario, 1 1 c.
Rotterdam, 175
Savannah, 500
Cape Coast, 12

Salt—*continued.*
Abonnema, 45 t.
Akassa, 300
Benin, 12
Calcutta, 3,119
Cape Coast, 12
Cape Town, 2 6 c.
Chicago, 235
Constantinople, 19 9
Gijonn, 5
Marsbrand, 370
Old Calabar, 40
Rosario, 8
Rouen, 10
Sherbro, 140 2
Valparaiso, 50
Hamburg, 100

Sodium Bicarbonate—
Amsterdam, 29 kgs.
Barcelona, 10 brls.
Bilbao, 22 15
B. Ayres, 100
Halifax, 200
Havre, 170
Melbourne, 200
Montreal, 60 cks. 50 kgs.
Newcastle, 120 kgs.
Santander, 40
Sydney, 167
" 60
Bilbao, 50
Bombay, 14 cks.
Boston, 50
Genoa, 40 4
M. Video, 25
Nagasaki, 200
Rouen, 50 brls.
Yokohama, 1,000

Soda Ash—
Baltimore, 513 cks. 90 tcs.
Beyrout, 30 brls.
Boston, 155 400 bgs.
Brisbane, 33
B. Ayres, 125
Calcutta, 4
Dundas, 10 t.
Mexico City, 57 cks.
Montreal, 99 tcs.
Napanee 15
New York, 384 259
Oporto, 10 pps.
Philadelphia, 87
Puerto Cabello, 4 brls.
Rio de Janeiro, 50
Santander, 21
Santos, 15 brls.
Tripoli, 90
Baltimore, 82 tcs.
Barcelona, 10 100 brls.
Beyrout, 30
Boston, 356 898 bgs.
Candia, 30
Ceara, 10
Leghorn, 34
Melbourne, 100
M. Video, 10
New York, 716 92 cks.
Odessa, 61
Oporto, 26
Philadelphia, 535
Rio de Janeiro, 100
Rosario, 255
Smyrna, 50
Tarragona, 35
Volo, 5

Sodium Carbonate—
Boston, 112 brls.
Bilbao, 30 dms.

Soap Powder—
Antwerp, 200 bxs.
Sydney, 11¼ t.

Sodium Sulphate—
Philadelphia, 6 c. £19

Sulphur—
Porto Rico, 5 t. £31
Iquique, 7 10 c. 52
Algoa Bay, 4 9 1 q. 44
Portland, 45 203
Para, 2 15 18
Halifax, 7 12 48

Sodium Nitrate—
New York, 1 t. 13 c. £52
Fiume, 6 6 2 q. 51

Saltpetre—
Syra, 2 t. 13 c. 2 q. £58
Portland, 10 11
Frontera, 1 3 26
Havana, 10 11
Carthagena, 6 9 120
Larnaca, 1 19 41

Salammoniac—
Genoa, 9 c. 1 q £16
Syra, 19 1 34
Odessa, 11 2 20
Hamburg, 10 3 19

Salammoniac—*continued.*
Philadelphia, 2 t 10 c. 2 q. £89
Alexandria, 2 68
Algiers, 3 5
Genoa, 11 18
Malta, 8 14
Norrkoping 10 1 17
Trieste, 2 1 72
Alexandria, 20 brls. 5 cks. 80
Syra, 1 38

Sodium Bichromate—
Genoa, 10 t. 15 c £290
Leghorn. 3 5 75

Sodium Phosphate—
Santos, 13 c. £18
Pasages, 5

Sodium Biborate—
Antwerp, 17 c. 2 q. £26
Hamburg, 1 t. 1 31

Sheep Dip—
Cape Town, 1 t. 10 c. £56
Natal, 8 2 q. 14
B. Ayres, 3 90
" 11 23
E London, 680 drs. 200
Algoa Bay, 3 134

Salt Cake—
Baltimore, 209 t. 13 c. £489
" 94 16 c. 224

Tar—
E. London, 250 dms.
Victoria, B.C. 20 brls.

Tartar—
Santos, 9 c. £60

Zinc Chlorate—
Bombay, 5 t. £72

TYNE.

Week ending December 3rd.

Alkali—
Amsterdam, 15 t. 10 c.
Hamburg, 7 3
" 5 4
Aarhuus, 2 19
Venice, 7 1
Rotterdam, 4 15
Copenhagen, 5 4

Antimony—
Gothenburg, 1 t.
Rotterdam, 2
Libau, 10 c.

Arsenic—
Venice, 15 t.

Barytes Carbonate—
Copenhagen, 10 c.
Antwerp, 10 t.

Barium Chloride—
Genoa, 1 t. 2 c.

Bleaching Powder—
Bergen, 13 t. 18 c.
Messina, 2 3
Amsterdam, 25 3
" 32 1
Antwerp, 50 2
Genoa, 5 6
Hamburg, 1 16
Christiania, 3 8
" 2 4
" 1 2
" 5 4
Rouen, 5
Stockholm, 1 16
Gothenburg, 10
Venice, 9 13
Rotterdam, 12 9
" 2
Copenhagen, 14 11
Libau, 25 6

Bone Ash—
Genoa, 10 t. 4 c

Barytes Nitrate—
Genoa, 1 t. 1 c.

Barytes—
Rouen, 25 t.

Caustic Soda—
Bilbao, 21 t.
Gothenburg, 10 3 c.
Genoa, 60 9
" 10 5
Hamburg, 11
Christiania, 5 13
Rouen, 1 15
Stockholm, 5 17
Odense, 1 2
Odessa, 57 15
Copenhagen, 2 18

Calcined Magnesia—
Barcelona, 2 t. 7 c.
" 9

Copper Sulphate—
Bergen, 1 t. 4 c.

Creosote Oil—
Bilbao, 1 q.

Copperas—
Aarhuus, 1 t. 15 c.

Litharge—
Genoa, 1 t. 2 c.
Hamburg, 16
Constantinople, 12
Gothenburg, 10

Magnesium Carbonate—
Barcelona, 7 t. 10 c.
" 9 10
Amsterdam, 5

Magnesia—
Hamburg, 6 c.

Manure—
Bergen, 10 t.

Naphthaline—
Riga, 300 bgs.

Potassium Chlorate—
Gothenburg, 6 t.
Hamburg, 5 c.
Gothenburg, 120
Odessa, 1 t.

Pitch—
Riga, 22 t. 11 c.

Soda—
Gothenburg, 30 t.
Amsterdam, 26 19 c.
Randers, 48 12
Hamburg, 3
Stockholm, 17 16
Varna, 2 13
Stockholm, 11 17
Aarhuus, 5 12
Esbjerg, 6 9
Odessa, 6 8
Venice, 10 5

Sulphur—
Rotterdam, 35 t. 17 c.
Gothenburg, 20
" 20
Stockholm, 35

Soda Ash—
Genoa, 10 t. 3 c.
Dunkirk, 5 19
Gothenburg, 50 8
Venice, 42 8
Odessa, 25 12
Copenhagen, 3 9
" 6 18

Sodium Silicate—
Genoa, 8 t. 15 c.
Bilbao, 11 6

Sodium Chlorate—
Rotterdam, 1 t. 2 c.

Soda Crystals—
Rotterdam, 18 t. 2 c.
" 4

Sodium Hyposulphate—
Constantinople, 1 t. 1 c.

Tar—
Riga, 33 t 10 c.

GRIMSBY.

Week ending November 29th.

Coal Products—
Dieppe, 25 cks.

Chemicals *(otherwise undescribed)*
Hamburg, 6 cks.
Rotterdam, 17 cs.

GOOLE.

Week ending November 26th.

Benzole—
Antwerp, 21 cks.
Ghent, 1
Rotterdam, 82

Bleaching Powder—
Hamburg, 32 cks.
Rotterdam, 36

Coal Products—
Antwerp, 1 ck. 1 drm.
Dunkirk, 26

Chemicals *(otherwise undescribed)*
Hamburg, 10 cks.

Dyestuffs *(otherwise undescribed)*
Boulogne, 1 cs. 1 ck. 1 drm.
Rouen, 2

Manure—
Boulogne, 84 bgs.
Hamburg, 448
Rotterdam, 479

Pitch—
Antwerp, 160 t.

HULL.

Week ending December 2nd.

Bone Size—
Hamburg, 5 cks.

Bleaching Powder—
Bergen, 7 cks.
Drontheim, 48

Borax—
Christiania, 4 cks.

Caustic Soda—
Abo, 15 drms.
Antwerp, 8
Dunkirk, 19
Helsingfors, 25

Charcoal—
Antwerp, 4 cks.

Chemicals *(otherwise undescribed)*
Libau, 170 cks. 70 pks.
New York, 193 200
Rotterdam, 2 16 68 cs.
Reval, 105 20
Stettin, 6
Abo, 2
Antwerp, 1 26
Bombay, 233
Bremen, 6
Bordeaux, 30
Christiania, 8 330 slabs.
Copenhagen, 145 34 4 drms.
Danzig, 1 8 pkg.
Gothenburg, 10 pks. 16
Hamburg, 5 13pkgs. 10
Harlingen, 13 10 6
Konigsberg, 4 10

Dyestuffs *(otherwise undescribed)*
Antwerp, 1 ck.
Bombay, 36
Drontheim, 1 bag.
Hamburg, 10 cks.
Rotterdam, 4 15 cs.

Manure—
Stettin, 182 bgs.

Pitch—
Antwerp, 62 t
New York, 226

Tar—
Abo, 42 cks.
Amsterdam, 6
Bombay, 100
Stettin, 5

GLASGOW.

Week ending December 4th.

Acetate of Lime—
Odessa, 16 t. 2½ c. £190

Bones—
Antwerp, 10 t. 2¼ c. £65

Bleaching Powder—
Calcutta, 40 t. £400
Melbourne, 6 ¼ c. 40

Copperas—
Melbourne, 39 c. £41

Carbolic Acid—
Halifax, 5¾ c. £25

Dyestuffs—
Turmeric
Halifax, 5 t. 9½ c. £87

Pitch—
Bombay, 23 t. 19 c. £68

Paraffin Wax—
Antwerp, 9 t. 2 c. £269
Syra, 1 3½ 59
Odessa, 2 13½ 54
Bilbao, 1 35
Melbourne, 210 320
Venice, 9 17½ 328
China, 13 13¾ 274

Potassium Bichromate—
Antwerp, 12 t. ¾ c. £291
Rouen, 34 10½ 918
" 749½ 1,175
Italy, 307½ 510
Venice, 251½ 395
Rotterdam, 12 cks. 96

Potassium Prussiate—
New York, £240
" 14 t. 5 c. 1,230

Sodium Bichromate—
Rouen, 4 t. 12 c. £96
Italy, 309½ 375

Soda Crystals—
Melbourne, 23 c. £35

Tar—
Bombay, 1 t. 17 c. £13. 10s.

PRICES CURRENT. WEDNESDAY, DECEMBER 10, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- & 12/-		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. ..per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. ,,	1	15	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	10	15	0
,, ,, (grey), Hull .. .. ,,	10	15	0
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11½
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	5	0
,, Carbonate (native) .. .. ,,	3	10	0
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	6	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	4	7
,, 50/90 ,, ... ,,	0	3	6
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	5¾
,, (crude 60°) .. .. per gallon	0	1	6
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	11
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	16	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	11
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	55	0	0
,, Sulphate .. .. ,,	19	0	0
,, Oxide (copper scales) .. .. ,,	55	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	12	6
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	0	0
,, Litharge Flake (ex ship) .. .. ,,	16	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	15	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	3
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	9
Oils:—			
Cotton-seed .. .. per ton	19	0	0
Linseed .. .. ,,	22	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅜
,, American .. .. ,,	0	0	5¾
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	19	15	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. per cwt. £3	5	0 to 3	10 0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	3	11¾
,, Nitrate .. .. ,,	0	2	10
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	2	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	10	0
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	17	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	5	0
,, ,, (70 % Caustic Soda) ,, ... ,,	11	5	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	5	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	15	0
,, Bicarbonate .. .. ,,	8	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9	0	0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	7	9
,, Nitrite, 98 % .. .. per ton	28	10	0
,, Phosphate .. .. ,,	16	0	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	6	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¾
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	15	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	27	10	0
Tin (English Ingots) .. .. ,,	95	0	0
,, Crystals .. .. per lb.	0	0	6⅞
Zinc (Spelter) .. .. per ton.	24	0	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

THE

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Notices.

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"Expert, Manchester."

TO ADVERTISERS.

SPECIAL NEW YEAR'S NUMBER OF THE "CHEMICAL TRADE JOURNAL."

In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers.

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

On the occasion of the New Year's Special Number, we shall make use of the whole of the lists we have referred to, numbering altogether, as we have stated not less than 10,000 names.

Of course, for this special issue. there will be special prices for advertisements, but those who order a series, either commencing with that number or previously, will have the advantage of our regular tariff rates, of bringing their specialities under the notice of a very large circle of buyers.

As only a limited number of pages will be added for advertisements, early application for space is necessary. We shall be pleased to send tariff of charges to all those who may desire to advertise in this Special Number.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates:—

30 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

REGISTRATION.

IF we look at the tendencies of the age, a very prominent one strikes us at once—the tendency on the part of those who follow a common line of business to combine and unite for the purpose of protecting themselves. It is not our business to discuss the question whether in so doing they are going against the natural law of the survival of the fittest, or the consequences of so doing. We state the fact, and in support of it we point to the following illustrations. Firstly, those who have followed the more proper course of qualifying themselves for a certain position and have then secured legal powers by statute or by charter. The oldest instance of this kind, we presume, would be found in the church, then we have the law, then medicine, then apothecaries, pharmacists, and dentists; in all these cases, unless a man has followed a legally authorised course to qualify himself, and has gone through certain formalities, examinational or otherwise, and has been placed upon certain registers, he cannot officiate as a clergyman, a solicitor, a barrister, an apothecary, a dispensing chemist, or a dentist. Call it ordination, "called to the bar," "entering his inn," becoming a Member of the Royal College of Surgeons, registration, the effect is the same, it benefits those who have passed within its barriers from the unlimited competition of those without. Obviously there is an advantage in this, inasmuch as it almost entirely prevents incompetent, half-trained men from doing bad work at low rates of remuneration. In the second place, are, those not protected by statute, such as trades unions and syndicates, which, by forming strong combinations of their own, beat down competition to a greater or less extent. See how the plumber is protected. Certain gas corporations in the country back their bills with the statement that they will not supply gas to premises where fittings have been put in by an "unauthorised" person. This is protection for the plumber. It is Hydra headed, it meets you oftener day by day as time goes on. In most of the professions in the first enumeration, there are various degrees of distinctions to which the protected person may attain, which tend to the material advantage of the fortunate possessor. Handsome certifiates in some cases testify to the fact that the holder has attained to a certain position, or to the Membership or Fellowship of some recognized body in the profession. It will be asked why do we enumerate these facts so patent, and more or less so familiar? For this reason, that among our readers there exists a large body of men, over whom no such protecting influence exists For the Analytical Chemist there is unlimited competition, even from boys. Not that the boys' work is worth as much as the Analyst's, but because it is cheap (?) whether it is nasty or not. We do not see why this should be, but we do know that it is an increasing difficulty, and one which unless some system of protective registration is adopted to prevent the shoals of more or less imperfectly-trained persons who are being annually turned out of the schools of this country from posing as analysts, will soon become a burden too grievous to be borne. The example we have mentioned of a gas corporation refusing to supply gas to premises fitted by

unauthorized persons might with advantage be imitated by firms refusing to give work to anyone who has not entered the Register of, say, The Institute of Chemistry. This as a temporary expedient is well enough, but, there is little hope that its adoption would be sufficiently general to be of much benefit. When the Institute of Chemistry was formed, there were not a few analytical chemists who felt to their sorrow that while the scale of wages of the working classes was steadily rising, and legislation was doing all it could for them in a grandmotherly way, the scale of remuneration of the class to which analysts, draughtsmen, clerks, etc., belong was steadily falling, owing to the unrestricted competition of persons, whose chief and strongest point was their low price.

These chemists indulged in hopes that the new organization would, by action similar to that of other professional bodies, raise the status of the chemist and eliminate this unlimited competition by preventing unqualified persons from practising as chemists, whether inside works or outside, and by so doing ultimately secure the chemist a fairer and better return for the trouble and expense of his education. They are now complaining that their hopes are apparently as far from realization as ever, and some of those who have joined the Institute complain that they have not even a good looking certificate to prove the fact. The Institute of Chemistry does not deserve all that has been said against it. It has a claim on our good will, and we have no doubt that ere long it will recognise its responsibilities and take action in the matter.

ANALYSES OF FERTILIZERS.

[*From a report of the Connecticut Agricultural Experiment Station.*]

WE have tabulated analyses of 65 nitrogenous superphosphates and guanos and of 33 special manures. These analyses have been made of samples collected in all parts of the state during April and May of this year by special agents of the station. Full discussion of these analyses is reserved for the annual report. Attention is here called to the following facts:—

Nitrogenous Superphosphates.—Of the 65 brands analysed, 22, or more than one-third, contain less of a single ingredient than is required by the manufacturer's guarantee. Two brands are thus deficient in respect of two ingredients. In only 7 cases is there a deficiency of the most valuable ingredient, nitrogen, and in several cases the deficiency is in potash and due to a form of guarantee which is misleading and in this State illegal. The manufacturer is required to guarantee the actual potash. "Potash, sulphate, 4 per cent.," is understood to mean 4 per cent. of actual potash in the form of sulphate and not 2·16 per cent. of potash combined with 1·84 per cent. of sulphuric acid.

The average cash ton price of these 65 brands has been 33.74 dols.; the average valuation, 28.14 dols.; the difference, 5.60 dols.; and the percentage difference, 19·9 per cent. This means that in general the purchaser has paid about one-fifth more per pound for nitrogen, phosphoric acid and potash when purchased ready mixed than he has had to pay for the same elements of plant food unmixed.

Special Manures.—Of the 33 brands analysed, 10 contain less of a single ingredient than is required by the manufacturer's minimum guarantee and two others are thus deficient in two ingredients.

The average cash ton price of these 33 brands has been 39.18 dols.; the average valuation, 32.90 dols.; difference, 6.28 dols.; and the percentage difference, 19 per cent.

Eleven of the special manures are designed particularly for the potato crop. The opinions of manufacturers, as well as those of farmers, would seem to differ widely regarding the fertilizers best suited to this crop, for it will be seen from the tables that the per cent. of nitrogen in the several potato manures ranges from 2 to 5·3 per cent., the phosphoric acid from 7·7 to 11·2, and potash from 4·2 to 10 per cent. If applied according to the manufacturer's directions, the different potato manures would supply from 13 to 53 pounds of nitrogen, from 52 to 100 pounds of phosphoric acid, and from 30 to 54 pounds of potash to the acre.

Four of the formulas contain about a third of their nitrogen in the form of nitrates, but four others contain no nitrates whatever. Two others contain all but a fraction of one per cent. of their nitrogen in the form of ammonia salts, but four others contain no ammonia. It is evident that each of these several brands may be an excellent general fertilizer.—*Oil Paint and Drug Reporter.*

Official Memoranda.

(From the Board of Trade Journal.)

PRODUCTION OF STEEL IN THE UNITED STATES.

THE following information respecting the steel production in the United States during the year ended 30th June, 1890, is extracted from a memorandum by Dr. William M. Sweet, of Philadelphia, to whom was entrusted the collection of statistics of iron and steel under the United States Census Act of 1st March, 1889:—

The total production of steel in the United States in the form of ingots or direct castings during the year ended June 30th, 1890, amounted to 4,466,926 tons of 2,000 pounds, as compared with 1,145,711 tons produced during the year ended May 31st, 1880; an increase of 3,321,215 tons, or 290 per cent.

The following table gives the production of the various kinds of steel in the form of ingots or direct castings in 1880 and 1890. The statistics for 1880 are for the census year ended May 31st, 1880, but for 1890 they cover the fiscal year ended June 30th, 1890. A few steel works produce blister, cemented, and other miscellaneous steel, but the quantity made annually is very small, and the statistics thereof for 1880 and 1890 are not included in the table below.

Kinds of Steel. (Ingots or direct castings.)	Tons of 2,000 pounds.	
	Year ended May 31, 1880	Year ended June 30, 1890
Bessemer steel	985,208	3,788,572
Open-hearth steel	84,302	504,351
Crucible steel	76,201	85,536
Clapp-Griffiths steel	—	83,963
Robert-Bessemer steel	—	4,504
Total	1,145,711	4,466,926

During 1880, 14 States contained steel-making establishments and steel was produced in that year in each of these States except Rhode Island and Maryland. In 1890 steel works were located in 19 States, and steel was made in that year in each of these States except Kentucky, Missouri, and Virginia.

Pennsylvania continues to occupy the position of the leading producer of steel in the United States, producing 57 per cent. of the total production in 1880 and 62 per cent. in 1890. Illinois was second in rank in both years, and Ohio was third. From 1880 to 1890 the increase in production in Pennsylvania was 324 per cent., in Illinois 241 per cent., and in Ohio 314 per cent. Since 1880 the manufacture of steel has been abandoned in two States, viz., Rhode Island and Vermont, and seven States have engaged in its production, viz., Alabama, California, Colorado, Indiana, Michigan, Virginia, and West Virginia.

BESSEMER STEEL.—The production of Bessemer steel ingots or direct castings in the United States during 1890, including steel made by the Clapp-Griffiths and Robert-Bessemer processes, amounted to 3,877,039 tons of 2,000 pounds, an increase of 294 per cent. over the production of 985,208 tons in 1880. In 1880 there were 11 completed works in this country for the production of Bessemer steel ingots or direct castings, which were located in Illinois, Missouri, New York, Ohio, and Pennsylvania, while at the close of 1890 the number of establishments containing Bessemer converters, including the works prepared to manufacture Clapp-Griffiths and Robert-Bessemer steel, had increased to 53, located in Colorado, Illinois, Indiana, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania, Tenessee, Virginia, and West Virginia.

Of the production of 985,208 tons of Bessemer steel ingots or direct castings in 1880, Pennsylvania produced 56 per cent., Illinois 26 per cent., and New York and Ohio each over 8 per cent. Of the production of 3,877,039 tons of Bessemer steel ingots or direct castings in 1890, including that made by the Clapp-Griffiths and Robert-Bessemer steel works, Pennsylvania produced 59 per cent., Illinois 22 per cent., Ohio nearly 10 per cent, West Virginia 5 per cent., New York over 2 per cent., and Colorado, Massachusetts, and Michigan each less than 1 per cent.

The Clapp-Griffiths and Robert-Bessemer processes were introduced into the United States during the past decade, the former from Great Britain in 1884, and the latter from France in 1888. Both processes are modifications of the ordinary Bessemer methods, but the converters employed are nearly all of small capacity. The first steel made in this country

by the Clapp-Griffiths process was produced at Pittsburgh, Pennsylvania, March 25, 1884. During 1890 seven works contained converters for the production of steel by this process, five of which were in operation in that year, producing 83,963 tons of steel ingots or direct castings. No new plants have been erected since 1887, and none are now under construction. The first steel produced in this country by the Robert-Bessemer process was made at experimental works at Springfield, Ohio, in September, 1888. During 1890 there were six completed works containing converters for the production of steel by this process, and one plant was in course of erection. The process may be said to be still in an experimental stage, but the results that have so far been obtained by its use are reported to be encouraging. During 1890 there were 4,504 tons of Robert-Bessemer steel produced in this country, principally in the form of castings.

The following table gives in tons of 2,000 pounds the production of Bessemer steel ingots or direct castings (the figures for 1890 including the quantity of steel made by the Clapp-Griffiths and Robert-Bessemer processes) and Bessemer steel rails in the United States in 1880 and 1890 :—

States.	Bessemer Steel Ingots or Direct Castings. (Including Clapp-Griffiths and Robert-Bessemer Steel.)		Bessemer Steel Rails.	
	Year ended May 31, 1880.	Year ended June 30, 1890.	Year ended May 31, 1880.	Year ended June 30, 1890.
California	—	—	—	5,654
Colorado	—	17,952	—	14,286
Illinois	253,514	867,805	201,186	622,260
Indiana	—	—	—	—
Massachusetts	—	15,753	—	—
Michigan	—	3,600	—	—
Missouri	8,409	—	5,100	—
New York	84,160	105,402	57,870	—
Ohio	82,811	385,576	66,480	17,335
Pennsylvania	556,314	2,297,726	409,339	1,377,119
Tennessee	—	—	—	—
Virginia	—	—	—	—
Vermont	—	—	1,500	—
West Virginia	—	183,225	—	—
Total	985,208	3,877,039	741,475	2,036,654

The remarkable growth that has taken place in the Bessemer steel industry of this country, during the past ten years, is well shown by the above figures. The increase in the number of establishments producing Bessemer steel has been the result, almost entirely, of the demand for steel in forms other than rails. All of the 11 Bessemer steel plants that were completed in 1880, had been built to manufacture steel for rails, many of them being added to previously existing iron rail mills. Of the 53 Bessemer steel plants at the close of 1890, only 14 made steel rails during that year, and, of the total quantity of rails produced, over 90 per cent. was made by ten of these works. Thus, while the production of steel rails has nearly trebled in amount since 1880, the number of establishments engaged in their manufacture has shown but little change in the ten years, although many of these works have greatly increased in size and efficiency. The competition in the manufacture of Bessemer steel rails has compelled many of the rail mills to convert a large part of the steel produced by them into forms other than rails, the production of rails, to any considerable extent at the present time, being possible only in works favourably located for the supply of cheap raw materials, and operated under the latest and most improved methods of manufacture. Included in the total production of Bessemer steel rails, during 1890, were 65,273 tons rolled in iron rolling mills from purchased Bessemer steel blooms.

While the demand for steel rails has shown a remarkable growth since 1880, thereby forcing a practical discontinuance of the manufacture of iron rails, there has also been a rapidly increasing use of steel for nails, bars, rods, wire, and other miscellaneous forms. The growth of the Bessemer steel industry in this direction is clearly shown in the number of plants that have been added to iron rolling mills during the past ten years, for the purpose of manufacturing steel in forms other than rails. The increased quantity of Bessemer steel manufactured in these miscellaneous forms is approximately shown by a comparison of the ingots and rails produced, over 75 per cent. of the ingots made in 1880 being converted into rails, while in 1890 the percentage of rails made to ingots produced was only 53 per cent.

Open-hearth and Crucible Steel.—The production of open-hearth steel in the form of ingots or direct castings during 1890 amounted to 504,351 tons of 2,000 pounds, as compared with 84,302 tons made during 1880. In 1880 there were 25 establishments containing open-hearth steel plants, located in ten States and in 1890 there were 58 establishments containing open-hearth steel plants, located in 12 States. Since 1880 the manufacture of open-hearth steel has been abandoned in two States, Vermont and Rhode Island, and four States have engaged in its manufacture, New York, Alabama, Indiana, and California. During the past few years, great activity has taken place in the erection of open-hearth steel plants, and indications point to a still larger production of this kind of steel during the next few years.

The crucible steel industry has shown but little progress since 1880, the production in that year amounting to 76,201 tons of 2,000 pounds, as compared with 85,536 tons produced in 1890. In 1880 there were 36 establishments containing crucible steel plants, located in nine States, while in 1890 the number of establishments had increased to 47, located in 11 States. For purposes requiring special grades of steel the product of the crucible process will be always in demand, but the high cost of manufacture prevents it in many instances from successfully competing in price with the other processes mentioned.

The Basic Process.—The first basic steel made in the United States was produced experimentally at Steelton, Pennsylvania, by the Pennsylvania Steel Company, on May 24, 1884, in a Bessemer converter. The beginning of the manufacture of basic steel in this country as a commercial product, however, dates from 1888, on the 28th of March of which year the first basic open-hearth steel was produced at the Homestead Steel works of Carnegie, Phipps and Company, Limited, at Homestead, near Pittsburgh, Pennsylvania. Since that date the manufacture of basic open-hearth steel has been continued at these works, and during 1890 this firm commenced the erection of eight additional open-hearth furnaces for the manufacture of basic steel, of which number four are now in operation, and the remaining four furnaces are expected to be ready for working in a short time. When completed these works will contain 16 open-hearth furnaces prepared to manufacture basic steel.

THE GERMAN BEER INDUSTRY.

THE United States Consul-General at Berlin, in his last report to the State Department at Washington, has the following information respecting the German beer-brewing industry :—

While Bavaria, Wurtemburg, Baden, and Alsace-Lorraine have each for itself a special beer tax, the remainder of Germany lying within the Customs district is subject to a brewery tax for the account of the Imperial Treasury. This district was materially enlarged during the year, by the admission of Hamburg, Bremen, and certain parts of Prussia and Oldenburg, representing 38 breweries—six in Altoona and Wandsbeck, 17 in Hamburg, 15 in Bremen. One half of these—six in Altoona and Wandsbeck, seven in Hamburg, and six in Bremen—brewed highly-fermented beer, while the other half—ten in Hamburg and nine in Bremen—produced unfermented sorts.

From October 15th (the date of the admission of Hamburg, Bremen, &c. into the Customs Union) to the end of the fiscal year (March 31st), these breweries produced 107,039 hectolitres* of highly-fermented and 262,099 hectolitres of unfermented beer, a total of 369,138 hectolitres, the tax amounting to 272,373 marks, and the rebate of taxes on exported beer being 4,858 marks. How great was the consumption of beer in those places may be seen from the following figures. In 1887, 419,603 hectolitres were imported into Hamburg, of which a very small part was again exported. In Bremen, exclusive of what was afterwards exported, 42,751 hectolitres were imported. In the same year 620,966 double centners† were exported from the Customs district to those parts of Germany outside of the Customs frontier, this being almost one-half of the total export, 1,314,762 double centners.

From the official reports it appears that the German beer production, which in the preceding year had risen, increased again in the fiscal year 1888-89, although the consumption was interfered with by the unfavourable weather of the summer of 1888, and also by the good fruit crops. The increase in the beer production in 1888-89 was confined entirely to the under-fermented (*untergahrige*) sorts, the highly-fermented beers having fallen off in amount. This was due, in part, to the bad weather, which was unfavourable to the consumption of highly-fermented (*obergahrige*) beers; but chiefly to the growing popularity of the under-fermented sorts, whose sale by the breweries was increased through depôts in other places, discounts to dealers, &c., and particularly through the growing popularity, in town and land, of bottled beer. As a consequence, the smaller breweries of the highly-fermented sorts decrease both in number and in amount of production.

The grain crop was bad, and the quality of the barley raised within the brewing tax district was not nearly what might be desired; consequently, large quantities were imported from South Germany, Bohemia, and Moravia, and small quantities from Denmark

†Double centner=220·5 lbs. * Hectolitre=22 gallons.

and Russia. Large quantities of ready-made brewing malt were also imported from Austria.

The use of malt surrogates increased, particularly the use of rice, sugar, and others not mentioned hy name. In consequence of the rise in the price of sugar, maltose syrup was more generally used.

Rice in the form of flour or broken grains, the waste from the Bremen rice mills, is used only in the manufacture of the under-fermented beers light in colour. The higher price of this in comparison with barley is offset by the fact that in the malt process, the latter loses 30 per cent. in weight, while the former in grinding suffers no loss. The addition of beer colour serves to give the proper colour to the beer instead of malt. For the same purpose colour-beers are manufactured in special breweries, which beers are not classified as malt surrogates, but are taxed as finished beers of malt and hops.

Hop culture is not largely carried on within the limits of the brewing tax district, and only in certain localities is it of any importance. These are the districts of Osterode and Johannisberg in East Prussia; Poerlitz in Pomerania; Neutomischl, Graetz, Wollstein and Maseritz in Posen; the Altmark in the province of Saxony; Lueneberg in Hanover; the Government district of Hohenzollern, part of the grand duchies of Hessen and Oldenburg, and a small part of the duchy of Brunswick. The price of hops in the province of Posen, where the quality was below the average, was tolerably high immediately after the harvest (best 300 marks, middle 140 marks per 100 kilogrammes), but it soon fell (best 180 marks, middle 60 to 80 marks, ordinary 40 marks). Prices elsewhere were: Allensteiner (East Prussia), 100 to 160 marks; Poerlitzer, 20 to 100 marks; Altmark, 80 to 100 marks; Dannenberger, 80 to 140 marks; Hohenzollern, 110 to 180 marks; Hesssian, 120 to 220 marks; Ammerland (Oldenburg), 70 to 100 marks; and Brunswick, 140 to 160 marks. The greater part of the hops used in the brewing tax district, and particularly that used for the better beers, came from Bohemia and Bavaria.

As above indicated, most of the highly-fermented beers were made in small rural breweries and consumed by the country population. Certain popular sorts are, however, an exception to this rule. These are manufactured in large well-regulated breweries, and are largely consumed by the city population. This is particularly the case with Berlin white beer and the so-called Graetzer beer, which is made in the province of Posen. As specialities, in some towns, highly fermented beers very rich in malt are made, which, in part (as the Danzig *Jopenbier* and the Bremen *Seefahrtsbier*) are meant for export or for use in provisioning ships, and in part for household and medicinal purposes (as the Brunswick *Mumme*).

Of the under-fermented beers there are three principal sorts, *Schank* or young beer, common lager beer, and the finer, stronger, lager beers (export beer, bock beer, Salvator beer, Maerzen beer, etc.).

One hundred kilogrammes of malt (used in the manufacture of highly-fermented beers) mixed with sugar, syrup etc., produce from 6 to 18 hectolitres of common, and from $2\frac{8}{10}$ to 7 hectolitres of strong beer (porter, double beer, etc.).

Of the under-fermented beers 100 kilogrammes of malt make 2½ to 5 hectolitres of good lager beer, 4 to 6 of common lager, and as much as $9\frac{8}{10}$ of *Schank* beer.

Owing to competition, domestic and foreign, brewers were compelled to drop their prices, and as an offset, to lighten their beers. The fall in prices, however, has been chiefly in the form of larger discounts to large buyers. It is also noted that prices vary in the same brewery according to the amount ordered, the responsibility of the buyer, competition and the cost of transportation. Average prices were as follows:—In barrels of 1 hectolitre, highly-fermented beers, common sorts, 6 to 12 marks; better sorts, ditto, 12 to 18; Berlin white beer, 11 to 15; Graetzer, 13; under-fermented *Schank*, 13 to 17; common lager, 16 to 20; better sorts, 20 to 25.

Since the entrance of Bremen into the Customs Union (October 15th, 1888) two breweries which manufacture only export beer, shipped from that city 45,000 hectolitres of beer.

From Wurtemburg it is reported that the decrease in beer production was due to the good fruit year, wine being cheap and the fruit crop larger than it had been since 1847.

From Alsace-Lorraine it is reported that the consumption of beer during the fiscal year 1880-89 was 876,640 hectolitres, against 868,462 hectolitres in the preceding year. The decrease in the number of breweries in Alsace-Lorraine is due to the competition of better arranged breweries in Baden and Bavaria. Hop culture is chiefly carried on in the district of Hagenau, and on a smaller scale near Strasburg, Colmar, Mülhausen, Münster, Saarburg, and Saargemünd. In the first mentioned district 2,868 hectares were devoted to hops, against 2,462 in the preceding year, when the average production per hectare was 925 kilogrammes.

The Alsatian barley crop was very unsatisfactory in 1888, as was also the French, the Hungarian being best.

TARIFF CHANGES AND CUSTOMS REGULATIONS.

RUSSIA.

MODIFICATIONS IN TARE ALLOWANCES.

Sir R. B. D. Morier, Her Majesty's Ambassador at St. Petersburg, in a despatch to the Foreign Office, dated the 25th November, transmits translation by Mr. Michell of a circular issued by the Department of Customs notifying the following modifications in the allowances for tare on certain goods coming under the Russian Customs tariff:—

Chalk, refined, imported in cases and barrels, 5 per cent.

Do., under point 3 of section 155 of tariff, 36 per cent.

China goods, imported under point 1 of section 156 of tariff, 33 per cent.

Do, under point 2 of section 156, 41 per cent.

Glasswares, imported under point 2, section 157, of tariff (with the exception of window glass, the tare for which remains unchanged) and under points 3 and 4 of the same section, 34 per cent.

Do, imported under point 5 of section 157, 51 per cent.

UNITED STATES.

FREE ENTRY OF VARIOUS ARTICLES OF DOMESTIC MANUFACTURE.

The following is a copy of a circular issued by the Treasury Department of the United States to its various Custom officers respecting the free entry of various articles of domestic manufacture:

1. The provisions of paragraph 649, Act of March 3, 1883, in relation to casks, barrels, carboys, bags, and other vessels of American manufacture, including shooks when returned as barrels or boxes, are reproduced in the same terms in paragraph 493 of the Act of October 1, 1890, with the following addition, viz., "also quicksilver flasks or bottles, of either domestic or foreign manufacture, which shall have been actually exported from the United States."

Articles 381, 382, 383, and 384 of the General Regulations of 1884, as amended by the Department's circular No. 85 of September 29, 1890, will therefore be continued in full force and effect.

SWITZERLAND.

CLASSIFICATION OF ARTICLES IN CUSTOMS TARIFF.

Note.—Quintal = 220·4 lbs. avoirdupois. Franc = $9\frac{5}{10}$d.

The following decisions affecting the classification of articles in the Swiss Customs tariff have recently been given by the Swiss Customs authorities.

Waste of hides not tanned, that is to say, the cuttings of raw hides and the cellular tissue between the flesh and the skin, which is removed to clean the latter, can only be admitted free under Category 1, as waste of hides for the manufacture of glue. Waste and cuttings of leather and of tanned hides of every kind are included in Category 7, and pay a duty of 20 centimes per quintal.

Grape wort concentrated by evaporation.—Category 9. Duty, 10 francs per quintal.

Vaseline in boxes.—Category 25. Duty, 7 francs per quintal.

Glass, stained, for large church windows.—Category 42a. Duty, 16 francs per quintal.

FRANCE.

CLASSIFICATION OF "DOULTON PIPES."

According to a recent decision of the French Customs authorities, drain-pipes of common earthenware, known as "Doulton pipes," are assimilated to stoneware, without ornamentation, of similar colour and grain, and pay accordingly a duty of 1 franc per 100 kilos.

FRANCE—MARTINIQUE.

IMPORT DUTIES ON BUTTER AND MARGARINE.

The *Journal Officiel* for the 19th November publishes a decree of the French President, fixing the following as the rates of Customs duty on butter and margarine imported into the island of Martinique:—

Butter, 15 francs per 100 kilos. net.

Margarine, oleomargarine, and other substances intended as.

ARGENTINE REPUBLIC.

TARIFF CHANGES.

The Hon. F. J. Pakenham, Her Majesty's Minister at Buenos Ayres, in a despatch to the Foreign Office, dated the 27th

October, forwards a statement of amendments in the Argentine Customs tariff, which had been put to the vote in the Senate and passed. The following is an abstract of the statement in question :—

Rice, Mandioca flour, dynamite, 15 per cent.

Non-galvanised iron or steel, in sheets, ingots, bars, etc., 10 per cent

Sulphuric acid, sulphate of lime, zinc, in bars or ingots ; lead, 5 per cent.

Starch, 90 dollars per ton.

Alcohol, in casks not exceeding 30°, 15 cents per litre.

Bottled alcohol, not exceeding 25°, nor one litre, 25 cents per bottle.

Kerosene, 5 cents per litre : stearine or paraffin candles, 18 cents per kilo, or 18 dollars per ton.

Free of duty, iron and steel wire up to 12 by 13 respectively ; benzene, for combustion ; sulphur, for industry ; quicksilver and sheep dips.

TENDERS FOR THE PURCHASE OF ANTIMONY ORE FROM THE SERVIAN GOVERNMENT.

The subjoined translation of a note issued by the Servian Minister of Commerce, inviting tenders for the purchase of certain antimony ore, has been received from Her Majesty's Minister at Belgrade, and was issued from the Foreign Office on the 2nd December.

On the 28th December next (9th January, 1891) there will be publicly sold at the Mining Section of the Royal Department of Commerce and Agriculture, to the highest bidder, 100,000 kilos. of antimony ore from the Government mines of Podringe. The conditions of sale, as well as the analysis of the above-mentioned ore, will be on view every day from 11 to 12 at the said office for (the convenience of) those concerned. Ten thousand francs (£400.) in cash must be deposited as caution money. Tenders must be sent in by noon on the 28th December (9th January, 1891) at the latest, with all particulars in accordance with prescribed conditions.

CHROMIUM MORDANTS IN COTTON DYEING.

THE bichromates of potash and soda are used to a large extent in dyeing cotton aniline black and chrome yellows and oranges. The dyeing of aniline black on cotton consumes large quantities of the bichromates if ungreenable blacks are to be produced. In dyeing of logwood blacks and cutch browns it is largely used. So far no method is known of mordanting cotton with chrome mordants in a perfectly satisfactory manner. In the cases of the use of chromes given above, these bodies are used either in the dye-bath or afterwards to fix the colour on the fibre. For such colours as alizarine, galloflavine, anthracene brown, gambine dioxine, which require the fibre to be previously mordanted, no chrome mordant has been found that will give full rich colours with these dyestuffs ; either there is not a sufficient quantity of mordant fixed on the fibre or the mordant is not uniformly distributed on the fibre, and uneven colours result. The employment of basic mordants with or without the use of glycerine to prevent too rapid drying gives only imperfect results. A method of mordanting sensibly superior to that ordinarily used consists in fixing on by the other of a salt of chromium and an alkaline solution of oxide of chromium ; a double precipitation of oxide of chrome occurs, which is derived partly from the salt of chrome and partly from the fixing bath. This gives very uniform and full shades more so than any other method of using chrome mordants. The basic mordant must contain a slight excess of oxide of chromium ; if the caustic soda be in excess the results are not as good, as the alkali prevents the proper fixation of the chrome oxide. For light colours a bath of basic mordant may be used, the fibre being laid down in it over night, then wrung, dried, and washed. Treatment with silicate of soda or ammonia will help to fix the oxide of chrome on the fibre. It has also been proposed that for colours where a light shade of grey will not have any appreciable effect, the cotton be dyed a light grey with bichromate, aniline acid, and then dye in the colouring matter as usual. There is some quantity of oxide of chrome deposited on the fibre, and this acts as a mordant. —*Textile Mereury.*

A HORRIBLE DEATH.—A ghastly discovery was made at Worthington's Salt Works, belonging to the Salt Union, at Northwich, yesterday morning. The men employed in salt boiling, on entering the hothouse, where squares of salt are stored for drying, encountered a horrible smell, and found the dead body of a man partially stripped. The body was half roasted and decomposed. It is supposed that he got in two or three nights ago to sleep. The man, who had a grizzly grey beard, is at present unknown.

SOCIETY OF PUBLIC ANALYSTS.

A ZEALOUS COUNCIL.

SUCH was the ardour with which the Council of the S. P. A. deliberated, that their sitting, which took place as usual, before the ordinary meeting of the Society, continued until nearly half an hour after time. Wretched private members kicking their heels and swearing softly, or grumbling audibly as their nature dictated, passed from the stage of impatience to discontent, and thence to incipient insurrection, and the execution of a proposal to carry the vacant chair by a *coup de main*, and hold an unauthorised indignation meeting, was only averted by the arrival of Dr. Adams in the nick of time. The smoulderings of rebellion were at once extinguished, and the whole company turned its collective wisdom upon the subject of butter.

THE COMPOSITION OF BUTTER.

Dr. Nieth, who knows as much about butter as any man, and more than most, read a paper characteristically bristling with statistics, in themselves numerous, but representing but the *average* of the figures that he had actually at command. Without wearying our readers with a bulky table, which they will doubtless see in due course in the *Analyst*, it suffices to give the pith of the author's observations, Fresh French butters rank high (*no double entendre* is intended) in the scale of excellence, "but if patriotic sentiment is wanted, we've patriotic butters cut and dried," it being a fact that English fresh butters head the list easily, containing more butter-fat, less water and curd. It is true that there is, as a rule, a trifle more salt, but this is accounted for, not by any inferiority in quality, but by the fact that many consumers of fresh butter prefer the addition of somewhat more salt, simply as a flavouring ingredient. Indeed, Mr. Allen, speaking as a North countryman, with much metropolitan experience, drew a distinction between North and South in this respect, saying that to Northern tastes, London butter was insipid. He confessed to siding with the Northerner and liked salt on his muffins.

At this juncture a still small voice was heard announcing that its owner had discovered that butter contained no oleic acid, the fact being presumably established by classic researches such as the said owner is famous for. No cheering followed the remark, possibly because the meeting was staggered by the weighty character of the announcement, coming as it did from such a source, and all were dumb until the president suavely pointed out that the question before the meeting was the composition of butter and not of butter fat, and adroitly staving off all attempts to enlighten the meeting on the latter point, in spite of the evident eagerness of its self-constituted exponent, allowed his eye to be caught by Mr. Cassal, who, to the astonishment of his intimates, appeared to have perceived an abuse somewhere in the Margarine Act, and to view it in an almost pugnacious spirit. So marked a deviation from his usual conciliatory tone, had the most disconcerting effect on the meeting which adjourned as soon as it decently could to recover its mental equilibrium by rest and refreshment.

OBTAINING OXYGEN FROM THE AIR.

A NEW process has been patented for obtaining oxygen from the air. At a red heat a mixture of lead monoxide and an alkaline earth will absorb oxygen, with the formation of lead dioxide and a plumbate of the alkaline earth employed ; and if carbonic acid be then passed over the mass the absorbed oxygen will be driven off. The applicant proposes to apply this reaction to the recovery of oxygen from the atmosphere. He passes air over a heated mixture of lead monoxide and lime, thereby absorbing the oxygen and allowing the nitrogen to pass off—$2CaO + PbO + O = Ca_2PbO_4$. When the mixture has been saturated with oxygen the air is turned off. Carbonic acid is introduced, expelling the oxygen, and itself combining with the remaining calcium oxide - $Ca_2PbO_4 + 2CO_2 = 2CaCO_3 + PbO + O$. The reaction is so rapid that at first only pure oxygen is evolved Towards the close of the operation some carbonic acid is disengaged, but this can readily be removed by a suitable absorbing agent, such as lime or sodium carbonate. The mixture of calcium carbonate and lead monoxide now remaining in the retort is immediately treated (at a red heat) with air, or, to hasten the expulsion of the carbonic acid, with steam and air. The same reaction (the absorption of oxygen) is thus again brought about ; and the process may be repeated at pleasure It is also possible to recover the carbonic acid used in the process. Other metallic oxides—the lower oxides of manganese, for example—may be employed instead of lead monoxide. The oxygen of the pure dioxide (PbO_2 or MnO_2) and of the corresponding metallic peroxides are also very easily driven off by carbonic acid.—*Date, 29th April, 1890, No. 6553, (Complete specification accepted 8th November 1890).*

AMERICAN COALS.

THE following are some results of the analysis of American coking coals, expressed in percentage :—

No.	Locality.	Water.	Volatile Matter.	Fixed Carbon.	Sulphur.	Ash.
1	Connellsville Basin, Pa.	1·260	30·407	59·616	0·784	8·233
1a	Coke from ditto	·030	·460	89·576	·821	9·113
2	Pocahontas, Va.	1·011	18·812	72·708	0·787	5 191
3	Pratt Seam, Gt Warrior Field, Ala	1·500	32·48	61·60	0·920	5·420
3a	Coke from ditto	·198	·578	88·875	8·993	1·182
4	Ditto, another sample	1·070	32·08	64·300	0.470	2·080
4a	Coke from ditto	·130	1·130	86·478	11·213	1·049
5	Sewanee, Tenn.	1·600	29·30	61·00	Traces	7·8.0
5a	Coke from ditto	—	—	83·364	1·054	15·449
6	El Moro, Col.	1·340	35·79	54·75	—	8·120
6a	Coke from ditto	·300	5·20	75·30	—	19·500
7	Crested Butte, Col	1·100	23·20	72·60	—	3·100
7a	Coke from ditto	—	·42	90·710	·580	8·870
8	Big Stone Gap, Va.	—	33·50	60·54	·412	2·40
8a	Coke from ditto	—	—	93·230	·749	5·690
9	Middlesbrough, Va.	1·29	31·91	65·02	·580	1·40
9a	Coke from ditto	1 30	1.30	91·896	·688	6·70

Analyses of the Log Mountain coals of Kentucky coals have recently been made by Prof. R. Peters, of the Kentucky Geological Survey, Lexington, Ky.. and the following results are given, date of August 10, 1890:

	"Lower Hignite" Bear Creek. 45 inch.	"Red Spring," Head of Hignite Lower Bench. 39½ inch	"Upper Hignite," Bear Creek. 42 inch.
Moisture	2.66	2.20	2.00
Volatile combustible matters	35.14	34.20	32.80
Fixed Carbon	59.70	60.40	59.50
Ash	3.50	3·20	5 70
Sulphur	0·840	0.576	0.986

	"Poplar Lick," Bear Branch. 50 inch.	"Lower Hignite," Showing Birdseye Cleavage. 45½ inch.	Cannal Coal, Bear Creek. 45 inch.
Moisture	1.80	1.60	1.00
Volatile combustible matters	33.00	33.40	51.60
Fixed Carbon	60.10	61.52	40.40
Ash	5.10	3.48	7.00
Sulphur	0.656	0.794	0.739

Samples of coal taken from the whole face of the veins were coked at the works of the Cumberland Valley Colliery Company, at Pineville, the analyses of cokes being as follows :

Local Names of Veins.	"Poplar Lick."	Hignite No. 1.	Hignite No. 2.	"Red Spring."
FixedCarbon	88.26	89.94	90.76	90.26
Ash	7·74	7·54	6.80	8.40
Sulphur	.673	.659	.521	.412
Moisture	3.00	2.10	2.00	1.00
Volatile Matter	1.00	.42	.38	.34

—*American Manufacturer.*

THE BLEACHING OF WOOL AND SILK

ALL who have been engaged in the bleaching of wool or silk by means of sulphur or bisulphite, will have met with grave inconveniences in the washing of the fibre after the bleaching. The most important draw-back is that the bleached fibre always exhibits a strong tendency to resume its yellow colour sooner or later, especially if it be treated with alkalis, ammonia, soda, etc. If there happens to remain any trace of sulphurous acid on the bleached fibre, as is inevitable, and mixed tissues should be formed, it will easily be observed that the dyed threads lose their colour when near those bleached by such a process. Professor Lunge, of the Polytechnic School of Zürich, has devised a method of meeting these inconveniences. It consists in the bleaching of the fibre either with sulphur, bisulphite, or sulphuretted hydrogen in the usual way, then passing the bleached fibre into a bath of peroxide of hydrogen in the following proportions :—For 100 kilos. of wool or silk—15 kilos. peroxide of hydrogen, 70 kilos. common water, and 1½ kilos. silicate of soda. The sulphurous acid contained in excess by the fibre, which causes the inconvenience mentioned, is oxidised by means of this last bath, and transformed into sulphuric acid, which is no longer injurious, and can be completely removed by simple washing.

THE RECOVERY OF SILVER AND GOLD FROM PLATING AND GILDING SOLUTIONS.

IN view of the rapid development and extension of the methods of electro-plating with silver and gold, and of the large amount of spent liquors containing silver or gold thus produced, it has long been desirable to find methods by which these metals can be recovered from the spent liquors. The processes hitherto adopted, generally necessitate the tedious and unpleasant evaporation of the cyanide liquors, or else involve a series of chemical operations which are somewhat difficult to carry out, so that actually, the used-up baths are sold to some firm which undertakes this recovery as a particular branch of its business.

A process invented by Stockmuir and Fleischmann and worked out by them in the chemical laboratory of the Bavarian Industrial Museum, is, however, exceedingly simple, and is employed in many establishments. In order to remove silver from a potassium cyanide silver solution, it is only necessary to allow a clean piece of plate zinc to remain in the liquid for two days; even better results are obtained by the use of iron conjointly with the zinc. In the first case, the silver often adheres firmly to the zinc, whilst in the second it always separates out as a powder. It is then only necessary to wash the precipitated powder which usually contains copper (since spent silver solutions always contain copper), dry it, and then dissolve it in hot concentrated sulphuric acid, water being added, and the dissolved silver precipitated by strips of copper. The silver thus obtained is perfectly pure. If the amount of copper present is only small, it can usually be removed by fusing the precipitated powder with a little nitre and borax.

In this way a spent silver bath was found to contain per litre

1st experiment	1.5706 grms.
2nd ,,	1·5694
Mean	1·5700

The presence of silver could not be qualitatively ascertained in the residual liquor.

Although sheet zinc, or zinc and iron sheets, serve so well for the precipitation of silver, they cannot be employed for the recovery of gold. The latter separates out in such a case very incompletely and as a firmly adhering lustrous film in the zinc. On the other hand, finely divided zinc, the so-called zinc dust, is an excellent substance to employ for precipitating gold quantitatively and in the form of powder from spent cyanide liquors. When zinc dust is added to a spent gold bath and the liquid periodically stirred or shaken, all the gold is precipitated in 2-3 days. The amount of zinc to be added naturally depends on the quantity of gold present. Freshly prepared gold baths for gilding in the cold contain on the average 3·5 grms. gold per litre; whilst those used for the hot process contain 0·75-1 grms. To precipitate all the gold in the original bath, 1·74 grms. or 0·37 —0·5 grms. zinc dust would be necessary, and, of course, a much smaller quantity would be sufficient for the spent liquors. Since the precipitation takes place more rapidly when an excess of zinc dust is present, it is generally advisable to add ¼ or at the most ½ kilo. of zinc dust to every 100 litres of solution.

The precipitated gold, which contains zinc dust and usually silver and copper, is washed, freed from zinc by hydrochloric acid, and then from silver and copper by nitric acid and thus obtained pure.

A spent bath treated in this way gave the following amounts of gold per litre.—

1st experiment	0·2626
2nd ,,	0·2634
Mean	0·2630 grms.

The presence of gold in the residual cyanide solution could not be qualitatively detected. The potassium cyanide of the solutions obtained by this process should be converted into ferrocyanide by heating with ferrous sulphate and milk of lime, since this substance is not poisonous and can therefore be got rid of without danger. It would, however, be more economical and, considering the large amount of cyanide present, more profitable to work it up into Prussian blue.

THE GAS STRIKE AT DARWEN.—The strike of gas stokers and labourers at the Darwen Gasworks ended a few days ago, when the men returned to work on the terms offered to them before they came out. The stokers will receive an advance of 3d. per day, and the labourers have 2d. per day advance. The men engaged during the strike are being retained, and the old hands, who are being taken on only as vacancies occur, have entered into an agreement not to interfere with them, either on or off the works. Twelve of the old hands commenced work yesterday morning.

PERMANENT CHEMICAL EXHIBITION.

VISITORS are admitted without charge; they are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., Ld., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool. — Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Ld., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Ld., Buckley.—Slabs, Blocks, Tiles Bricks, &c., of Fireclay and "Metalline," material.

Chadderton Iron Works Co., Ld., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co, Ld., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne. — Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant —Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester. — Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, 25, Listria Park, Stamford Hill, London.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-, Ammoniated Lime, &c.

Galloways, Limited, Manchester. — Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co., Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters.

Joseph Kerrhaw and Co., Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet. Makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester. — Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Marple Chemical Co.—Improved Iron Carboy Hampers.

Meldrum Bros., Manchester. — Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Worthington Pumping Engine Company, London.— Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water, Softening Apparatus.

EXAMINATION OF OILS, FATS, AND ALLIED SUBSTANCES.

By Thomas T. P. Bruce Warren. *

IN examining oils, &c., no test should be considered as superfluous. There are some tests which are more important than others as regards their special significance, so that experience must decide the procedure to be followed in particular cases.

The specific gravity of an oil or mixture, if fluid, at 60° F., should always be noted at this temperature: fats, concrete oils, thick lubricating petroleums, should be taken at 100° F. The expansion of an oil is an important factor, the temperature at which it begins to show a divergence from the mathematical functions used in constructing a curve for constant or variable changes should also be noted. In this way we can frequently detect changes where chemical methods would be extremely troublesome even if possible

A specific gravity bottle is constructed holding 25 c c. to the neck, which is graduated and widened at the top into a funnel for the convenience of filling and retaining any oil beyond the capacity of the neck. The capacities of the bottle and the graduated neck are determined by pure mercury, so that the expansion due to the glass itself can be accurately measured and allowed for if required. It is preferable to distil the mercury direct into the bottle, otherwise the expulsion of air is very troublesome.

The difficulty of adapting different forms of Sprengel tube for this purpose led to the designing of this form of specific gravity tube. In using this it is immersed in water or oil to the upper mark of the neck. A platinum wire serves as a suspension for weighing or holding in an oil or water bath.

Knowing the capacity of the bottle, the specific gravity of an oil occupying the same bulk is easily determined.

The expansion of an oil is taken as being simply an arithmetical mean for the observed differences of temperature. This is certainly not correct; the first effect will be to expand A, the original bulk to $A + a$, a further increment of heat will expand A and a together, and so on for every successive increment of volume; consequently the expansion is in a geometrical ratio, and so long as no abnormal change takes place, we obtain a logarithmic curve in which the axes x and y follow a regular rate of variation. If on the axis x we represent the thermometrical increments, then y will show the corresponding volumes.

When something happens which makes the curve change with respect to its initial ordinates, it is a common thing to say that an interpolation formula must be introduced. Now whenever this occurs there must be some change to explain; either the capacity for heat has altered, so that an increased temperature no longer produces an uniformly corresponding mechanical effect, or some chemical change has crept in which upsets the previous mathematical relation of x and y.

We can discard for the present the examination of these points by polar co-ordinates and endeavour to find out by chemical methods what is really taking place. We know by the curve when a change has begun, and we can also tell between what points the change is uniformly constant; another interpolation or point in the curve indicates another change, and so on. At all these points an oil should be examined when cooled down to the original temperature. Some oils are more stable than others at the same temperature, and a mixture of two oils, such as olive and sesame oils, can be readily detected. The chemical change is due mainly to the loss of glycerine and to the partial oxidation of the fatty acids thus set free. Oils which are easily oxidised are best heated in a flask with a bent neck dipping under mercury, or in connection with a vacuum pump.

The iodine absorption of an oil, if taken before and after heating, shows a diminished absorption which may be due to oxidation or other causes. Sulphur chloride shows that glycerine has been expelled.

In some cases it is useful to know the rate at which an oil absorbs oxygen, and how the same is expended; a measured volume of the gas contained in a graduated gas tube with an outlet at the top, standing over mercury is connected with a suitably constructed flask containing the oil, the air in which has been displaced by oxygen. the volume of which is noted. The residual gas in the tube is analysed; the CO_2 represents approximately the glycerine set free, and the deficiency of O beyond this shows what the oil and fatty acids have retained.

"The Oxidation of Lubricating Oils," by Dr. O. Bach, was given some time ago in the *Chemiker Zeitung*. This interesting paper will be referred to when dealing with machine oils.

* From *The Chemical News*.

SAD DEATH OF A GAS ENGINEER.—Mr. John Deakin, gas engineer, was drowned at Seacombe, near Birkenhead. He had shot a bird, which fell on to ice covering a deep pit. His dog fell through the ice in going to fetch the bird, and Mr. Deakin, in trying to get the dog out, also fell through the ice and was drowned.

TANNIN AND ANTIMONY AS MORDANTS.

WHEN a solution of tannin is added to a solution of a basic coal-tar dye, the latter is precipated as colour lake, insoluble or nearly so. The complete precipitation is in some cases prevented by the acid which is present in combination with the colour-base, which is due to the solubility of the colour lake in this acid; by neutralising with soda this action can be prevented and the colour completely precipitated. Justus Koechlin has found that for 4 parts of magenta, there are required 5 parts of tannin and 2 parts of soda for complete precipitation of the dye-stuff; for 4 parts of malachite green, 5 of tannin, and one of soda are required; and for 4 parts of methyl green 10 parts of tannin and 4 parts of soda. G. H. Hurst, in his work on "Aniline lake making," gives from 1 to 1½ parts of tannin for each part of colouring matter used, says nothing of soda being required, and further states that the whole of the colouring matter is deposited. If the tannin is greatly in excess there is a slight tendency for the colour lake to be re-dissolved.

The application of tannin in the dyeing of cotton is carried out as follows:—The yarns or tissues are first passed through and allowed to steep in a solution of tannin containing ¼ lb. of tannin in a gallon of water, using the bath at from 50° to 60° C., and allowing the fabrics to remain in six hours. For delicate colours it is necessary to use as pale a tannin as it is possible to get; for dark shades the tannin may be replaced with economy as to cost by about twice its weight of sumac extract or five times its weight of sumac. No strict rules can be laid down as to the quantity of tannin to be used, as it depends much on the quality of the tannin materials employed and on the kind and quantity of dye-stuff used. Generally about 2 to 3 per cent. of tannin is employed for medium or pale shades, and 4 per cent. for dark shades, these quantities being calculated on the weight of cotton to be dyed. If the tannined cotton were entered directly into the dye-bath, some of the tannin would become dissolved off the fibre, and, passing into the bath, would precipitate some of the colouring matter out to the bottom of the bath. This would also get on the fibre, and being loose would cause the latter to be dirty or rub very much. To prevent this the tannin is fixed on the fibre by means of a metallic mordant, such as antimony or tin. This is done by passing the tannined cotton through a solution of metallic salt. A large number of these are and have been used, alum, tin crystals, antimony chloride, and other antimony preparations, etc. Of all these, tartar emetic has been found to be the one that gives the best results, and is the almost universal mordant or fixing agent for tannin now in use. This is because it contains a fairly large proportion—about 43 per cent.—of valuable metal, is neutral, and any free acid that may be formed from it does not appreciably affect the colour or prevent its dyeing properly, as happens with other dyeing preparations and salts of antimony. Many substances have been proposed and offered as substitutes for tartar emetic, but as yet none have been found to equal it.—*Textile Mercury.*

"CHICLE."

"CHICLE" is the first substance employed by the Americans for making "neptunine," which is used to render any kind of tissue impermeable.

This gum is not only produced by the "zapote;" it is also extracted from a plant of the asclepiad family, which is called in Mexico "yerba del chicle."

This plant in a cold country becomes bushy, and its cultivation, which is very easy, presents considerable advantages, because the juice obtained from it yields a varnish which is denser, more transparent, and less hard than caoutchouc.

The Indians occupy themselves with this extraction in the states of Plaxcala, Puebla, and Hidalgo.

The process employed is of the most primitive nature; they commence by grinding the plant or reduce it to a fine meal and then press it, subsequently concentrating the juice by the aid of heat to the required extent. The liquid is then poured into moulds, from which it is removed after cooling in the form of bricks or loaves, and is then sent into the market.

According to information received by the Minister of Public Works and Agriculture, it is known that this plant grows abundantly in the sandy plains of Plaxcala, Huamantta, and Apam; it is also found plentifully in the neighbourhood of Ixtengo, Nopalucan, Otumba, Teecoa, Tacuba, etc.

The chicle plant ought to be made the subject of serious study by agriculturalists, for, we repeat, it can be cultivated with little expense and without need of any great initial outlay. It is a product which is largely required for industrial purposes, and commands a ready sale.—*Moniteur de la Teinture.*

NOTICE.

WE beg to inform our readers that the lecture on "Chlorine Production" announced for February 3rd, at the Manchester Technical Laboratory, will not take place.

This is rendered necessary by the fact that we are preparing a large working model of the plant to be used in our new process of "Sewage Treatment," which will be shown, in operation, at the lecture on

March 3rd, 1891, at 7 p.m.

We will reserve seats for this lecture for such of our friends who desire to be present and who will notify the same to us, and it may be well to state that we expect a large attendance.

Tea and coffee at 6-30 p.m. in the Exhibition room.

Correspondence.

ANSWERS TO CORRESPONDENTS.

HIGHLANDER.—Rio Tinto.

P.M.S.—Keep your money out of the concern.

W.G.L.—We cannot advise you, ask a solicitor.

H.B.—Nothing better than sulphate of ammonia.

INSTITUTE.—Perhaps it is because you have paid your subscription at the end, instead of the beginning of the year.

H.S.—Any oil and colourman will keep it in stock.

B.—Your letter is libellous. Is that why you forgot to send your name and address?

NICKEL.—New Caledonia and Sudbury, Ontario.

C.R.R.—Advertisement.

J.B.—

***We do not hold ourselves responsible for the opinions expressed by our correspondents.*

THE ADULTERATION OF COAL.

(To the Editor of the Chemical Trade Journal.)

SIR,—Your leading article upon the above subject, while putting the case forcibly, does not err on the side of overstating the case. Will you allow me as a works' manager to say that I have from time to time had the percentage of ash determined in the coals I was using. I have found all sorts of percentages from 4 or 5 per cent. to 50 and even 60 per cent. Surely, sir, such a wide variation as this shows the necessity for legislative interference. I have seen, more than once, men actually engaged in throwing the worthless rubbish from the pit bank among the good coal which was being sent to customers. As you say, this is nothing else but adulteration. I think colliery owners should do something to prevent dealers palming off someone else's coal as theirs. I enclose my card, and remain

MANAGER.

Trade Notes.

NEW DYESTUFFS.—Messrs. Leopold Cassella and Co. are introducing a new dyestuff, under the mark Croceine AZ, for dyeing the various intermediate shades from crimson red to light pink. The shades are said to be particularly deep and brilliant on cotton and jute. It is claimed that the new colour has a great affinity for these fibres, and that it is very fast to light.

SULPHURIC ACID IN GREECE.—The consumption of this article is very great in Greece; it is supplied by Germany and France. The degree of condensation is of the medium kind, with exception of a small part, designed for the maufacture of explosive objects. The import dues amount to 10 leptas for commercial sulphuric acid, and 20 leptas for pure acid per kilogramme, nett. The Excise duty is 1 lepta per kilogramme.

PURE STANNIC CHLORIDE.—Pure stannic chloride, according to a paper by Mr. W. Coldridge—*Phil. Mag.*—heated as high as its boiling point, does not conduct electricity. The author investigates the effect of mixing foreign substances with the chloride, and discusses the whole question of electrolytic conductivity from the theoretical standpoint. Addition of chlorine had no effect on the conductivity, but dry hydrochloric acid permitted a small current to pass. Dry hydrogen sulphide had an electrical influence. It was observed, however, to precipitate white crystals from the chloride. These have the composition, $SnCl_4$, $5H_2S$, and are decomposed on heating, leaving a residue of SnS_2. Dumas's compound, $SnCl_3$, SnS_2, has no existence. The author attributes—*Journal Chem. Soc.*—electric conductivity to non-homogeneity of the electrolyte and consequent chemical exchange.

Market Reports.

REPORT ON MANURE MATERIAL.

There has been a fair amount of business during the past week, but at prices still tending rather in favour of buyers.

Quotations for mineral phosphates are without material alteration. No important business is reported, but we believe that several transactions have taken place in Florida stock for shipment ahead.

Several cargoes of River Plate bones have changed hands at about £5. 3s. 9d., delivered good, U. K. ports, and that price is full closing value. Some further business has been done in crushed East Indian Bones, at £5. 2s. 6d. per ton, and that price would still be business for shipments near at hand, though it has been refused for shipment ahead. Quotations for East Indian bone meal remain at about £5. to £5. 10s. per ton, according to quality, ex quay, Liverpool. Common grinding bones are worth about £5. per ton, ex quay Liverpool, for prompt shipment. There are still sellers of River Plate bone ash at £5. on 70%, nett cash, Hamburg terms, but no buyers at the price.

There has been considerable business doing in cargoes of nitrate of soda, arrived at port of call, at easier prices, spot value is 7s. 6d. to 7s. 9d. per cwt., according to quality and quantity. Due cargoes are worth about 7s. 6d. per cwt., and October-November shipments are not worth more than 7s. 9d. per cwt.

We do not hear of any further business in Liebig's guano, though 10s. per unit of ammonia and 1s. 3d. per unit of phosphate of lime would be accepted for a cargo delivered good, U. K. port.

There is more enquiry for dried blood, which, however, has not resulted in much business. Nearest value is 10s. 3d. per unit, free to rails at works, for fine home prepared, and for River Plate 10s. per unit, ex store, Liverpool. Superphosphates remain firm at 50s. per ton, in bulk, delivered f.o.r. at works, with enquiry for export.

THE METAL MARKETS.

LONDON, WEDNESDAY.—Pig iron steady. Scotch warrants closed at 46s. 6d. cash and 46s. 9½d. one month. Middlesbrough, 42s. 9d. cash; hematite, 54s. 3d. cash. Copper rather easier. Chili bars, G.O.B.'s and G.M.B.'s closed at £53. 15s. to £54. 2s. 6d. cash, and £54. 7s. 6d. to £54. 15s., three months. Tin fell about £1. Straits closed at £91. 12s. 6d. to £92. 17s. 6d., cash, and £92. 7s. 6d. to £92. 17s. 6d. three months; English ingots, £96. Lead: Spanish, £12. 15s.; English, £13. Silesian Spelter: ordinary, £23. 7s. 6d. to £23. 10s. Quicksilver, first hands, £9 5s.; second hands, £9. 2s. 6d. per bottle. In copper shares business was limited. Copiapo 2⅜ to 2⅝; Mason and Barry, rose 1/16 to 7¼; Rio Tinto rose ¼ to 23 1/16.

GLASGOW, WEDNESDAY.—An idle market; prices steady. Scotch done at 46s. 8½d. and 46s. 6¾d., cash, also at 46s. 10½d. and 46s. 9d., one month; closing buyers at 46s. 6½d. cash, sellers ask ½d. more. Middlesbrough closes with buyers at 42s. 9d. cash, and 43s. one month, sellers ask 1½d. more. Hematite done at 54s. 3d., cash; closing with buyers at 54s. 3d., cash and 54s. 6d. one month; sellers ask 1½d. more.

WOLVERHAMPTON, WEDNESDAY.—There was only a quiet market to-day, as is usually the case just before Christmas, consumers waiting until the quarter has turned before committing themselves to forward requirements. At the same time a fair amount of old business is still under execution, and this is affording pretty steady employment both to furnaces and at ironworks. Producers of pig iron complain of the manner in which large purchasers try to beat them down in price, and declare that with coke as dear as it is at present they cannot afford to reduce quotations.

THE LIVERPOOL COLOUR MARKET

Colours remain unchanged. Ochres: Oxfordshire, common, £10., medium, £12., best, £15.; Derbyshire, common, 40s., medium, 50s., best, 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber: Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

THE TYNE CHEMICAL REPORT.

TUESDAY.

There is no change to report in the position of the chemical market here, which continues in a quiet state, with the exception of caustic soda and recovered sulphur, for which there is a brisk demand, the price for the latter having been again advanced five shillings per ton during the past week.

The market prices of to-day are as follows:—

Bleaching powder, in softwood casks, £6. 15s. per ton; in hardwood casks, £7. per ton, both less 3½%. Caustic soda 77%, £12. per ton, nett; ground and packed in 3-4 cwt. barrels, £16. per ton, nett; 70%, £11. 5s. per ton, less 3½%; white alkali, 1⅛d. per degree, less 2½%; soda crystals, 56s. per ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; ground and packed in casks 53s. per ton, both less 3½%; recovered sulphur, in 2 cwt. bags, £5. 5s. per ton, nett; chlorate of potash 5½d. per lb., less 5%; silicate of soda 75° Tw., £2. 15s. per ton; 100° Tw., £3. 10s. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. 10s. per ton; in 5-7 cwt. casks, £6. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £7. 15s. per ton; nitrate of baryta crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton; carbonate of alumina, £27. 10s. per ton; aluminate of soda, £32. 10s. per ton; hydrate of barium, £8. 10s. per ton. All f.o.b. Tyne, or f.o.r. makers' works.

There is no change to report in the price of small coals. Northumberland small, quoted from 4s. 9d, to 6s. per ton, and Durham small from 6s. 6d. to 7s. 6d. per ton, delivered into craft.

MISCELLANEOUS CHEMICAL MARKET.

The alkali trade continues brisk in all departments, and prices of the market continue steady. The quotations of the United Alkali Co. are without change during the week, and values are as follows, viz.: Bleaching powder £6. 12s. 6d., softwood, on rails, makers' works; hardwood, f.o.b. Liverpool, £7. per ton. Caustic soda, 70%, £11. 5s. per ton; 60%, £10. 5s. per ton. Soda ash, caustic, 1 1/16 per deg. to 1⅜ (carbonated), 1⅜ to 1 7/16; refined soda ash 1⅝ per deg. Muriatic acid, 9d. to 10d. per carboy. Recovered sulphur unobtainable for spot or early delivery; for forward delivery (over 1891), £4. 12s. 6d. to £4. 15s. per ton, in bulk at works. Vitriol is in brisk demand, and prices are strongly maintained. Chlorate of soda, 6¼d. per lb. Sulphate of copper very dull, notwithstanding the large reduction of make, and price, from £18. 10s. to £19. Muriate of ammonia quiet, and price rather weaker for spot delivery. Salammoniac in steady demand, and without change of price. Acetates of lime have slightly declined, but there is no pressure to sell below the present prices of £7. 15s. and £12. 15s. per ton for brown and grey respectively, at usual points. Acetic acids are depressed by over competition. Acetate of soda steady at the advance; other acetates quiet. Lead nitrate and acetate dull. Litharge lower. White powdered arsenic finds ready sale at full market rates. Potash, caustic and carbonate, still firm, and difficult to obtain for prompt delivery. Prussiate of potash firm at 10d. Bichromates, chromic acid, tartaric acid, oxalic acid, sulphocyanides, tin and zinc salts, and all products used in dyeing and calico printing are rather below average demand.

TAR AND AMMONIA PRODUCTS.

The benzol market retains its firmness; in fact, prices have again advanced, and a penny more is asked per gallon, for 90s and 50-90s. Solvent naphtha is in great request at old rates, and creosote is finding a ready sale for the various purposes for which it is now employed. Crude carbolic acid is weak, and there seems no immediate prospect of its hardening. Anthracene remains as quoted in last week's report, and there seems every probability of the present prices being maintained. Pitch is firm, 36s. being the price f.o.b. London.

The sulphate of ammonia market has again a much quieter tone, and dealers are doing their utmost to depress the position. Business at Hull has been reported at £10. 12s. 6d., and it is stated that Leith can be bought at the same price. These values, however, clash with the prices which makers have been able to obtain, and it seems evident that a good deal of quiet buying is going on amongst speculators to cover previous sales. London outside makes are nominally standing at £10. 12s. 6d. Beckton being nominally £10. 17s. 6d.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Without any special falling off in price to record as bearing upon the general market, it is still to be noted that matters are a shade easier for the buyers, particularly for spot orders. Taking the market sectionally, there is the recession of bicarbonate of soda to note, the quotation being back again at the October and November mark. As regards the paraffins the feeling is distinctly stronger, with the exception of burning oils, and the obtainable price of paraffin wax, 120° semi-refined, is now fully a farthing a pound in excess of makers' minimum stop, while scale, naphtha, and lubricators are all very stiff at recent quotations. Just upon the stroke of last week's despatch, sulphate of ammonia developed a sort of a rally which was continued during the week with a fluctuating success. Quotations mounted fractionally, and it is certain that as high as £10. 13s. 9d. was paid; possibly £10. 15s. may have been done, as rumour had it at the time, but dealers are sceptical now on looking back. To-day the top value does not exceed £10. 12s. 6d., indicating a return of the old weakness. In bichromates the demand has again been very slack, especially for home consumption, and makers have been obliged to offer further inducements in the way of larger discounts.

Chief prices current are: Soda crystals, 56s. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 2½%, Tyne; caustic soda, white, 76°, £13., 70/72°, £11. 5s., 60/62°, £10. and cream, 60/62°, £9. 12s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £7., and 1 cwt. casks, £7. 5s., net Tyne; refined alkali, 48/52°, 1⅝d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £6. 7s. 6d. to £6. 15s., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 9% and 10% for Scotch and English deliveries respectively, for export 3½d., less 10%, f.o.b. Glasgow; bichromate of soda, 2¾d., less 7½% and 10% for Scotch and English deliveries respectively, for export 2½d. less 10%, f.o.b. Glasgow; chlorate of potash, 5½d., less 5% any port; nitrate of soda 7s. 10½d. to 8s.; sulphate of ammonia, £10. 12s. 6d. f.o.b. Leith; salammoniac, first and second white, £37. and £35., less 2½% any port; sulphate of copper, £18. 10s., to £18. 15s. less 5% Liverpool; paraffin scale, hard 2¾d., and soft 2⅝d., per lb; paraffin wax, 120°, semi-refined, 3⅝d. to 4d.; paraffin spirit (naphtha), 9d. a gallon; paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English and Irish orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 5s. to £6. 10s., and 890/895°, £7. 10s. to £8. Week's imports of sugar at Greenock, were 50,190 bags.

THE COPPER MARKET.

Messrs Harrington and Co.'s copper report, dated Liverpool, 16th December, 1890, states:—Chili charters for the first half of December are advised as 750 tons, making the total since January 24,600 tons, against 21,900 tons for same time last year.

Since our last, prices advanced from £55. 5s. cash and £55. 17s. 6d. three months, to £56. 5s. and £56. 17s. 6d. respectively; but, owing to orders from America to sell, the market gave way, and fell to £54. 2s. 6d. cash, and £53. 15s. three months, on the morning of the 8th instant, but subsequently closed 5s. better in the afternoon. Yesterday the market again fell, and touched £52. 10s. and £53. 7s. 6d. spot and three months, and, owing to the rise in silver, prices rose later to £53. 10s. and £54. respectively; closing firm to-day, at £53. 17s. 6d. cash, and £54. 15s. forward.

The "Shamrock" arrived from Havre with 599 tons of Chili bars, which were transferred to the Swansea stock.

The total decrease for the fortnight in the Liverpool, Swansea, London and Havre stocks is 1,353 tons.

The present stock of English G.M.B.'s in warehouse, Liverpool and Swansea, is 3,081 tons, against 3,304 tons on 1st inst., showing a decrease of 223 tons.

Refined and manufactured are quiet, quotations are—English tough, £59. to £60.; best select, £61. to £62.; strong sheets, £67. to £68.; Indian sheets, £63. to £64.; yellow metal sheets, 6d. to 6½d. per pound.

The sales of furnace material during the last fortnight comprise—at Liverpool: 18 tons Chili regulus, at 10s. 9d.; 300 tons Argentiferous Anaconda, on private terms; 50 tons Montana matte, at 10s. 9d.; 100 tons Spanish matte, at 10s. 6d.; 18 tons Portuguese precipitate, at 11s. 10 tons Peruvian ore, at 10s. 6d.; 50 tons (Penaflor) Spanish ore, 12 to 15 per cent., at 9s. 3d., and 50 tons (Penaflor) Spanish ore, 6 per cent., at 8s. 6d.; 200 tons ordinary Anaconda matte, at 10s. 4½d.; and 400 tons ordinary Anaconda matte, at 10s. 3d. per unit. At Swansea—400 tons Namaqua ore, at 10s. 7½d.; and 100 tons Cape ore, at 10s. 6d. per unit.

THE LIVERPOOL MINERAL MARKET.

Our market has continued to rule firm during the week. Manganese: Arrivals this week still small; prices unaltered. Magnesite: Stocks of raw lump enormous. Sales are slow, and prices exceedingly low. Raw ground, £6. 10s., and calcined ground £12. 10s. Bauxite (Irish Hill brand): steady, without alteration in prices. French chalk: Arrivals this week are very small; prices steady. On account of the closing of the year sales are somewhat reduced, the whole of them have gone into consumption, and prices are firm as last reported; G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate easier; sulphate in demand, best qualities "Angel White," No. 1, 70s; No. 2, 60s. to 65s; No. 3, 45s. Pumicestone: Lump and ground steady. Iron ore in fair demand; manganiferous in request, and prices firm. Santander, 9s. to 10s. 6d., f.o.b.; Irish, 11s. to 12s. 6d.; Cumberland, 9s. to 10s. 6d. Emerystone: Best brands continue to be inquired for. No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: More inquiry; 45s. to 50s. for best yellow; fine impalpable ground, £7. "Emerald" ground 80s. Scheelite, wolfram, tungstate of soda, and tungsten metal more doing—prices somewhat advanced. Chrome ore: High grades inquired for at full prices. Antimony ore and metal firm as last quoted. Asbestos continues firm, especially Canadian rock. Potter's lead ore: "Standard" brands steady; smalls, £13. to £14.; selected lump, £15. to £16. Calamine: Good qualities in demand at advanced prices. Strontia sulphate (celestine) steady, 15s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: A good business doing; English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, quieter. Plumbago: Best qualities sought for; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, 20s. to 22s. 6d. Ground mica, £50. China clay easier; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), inquired for, finest quality 22s.

New Companies.

A. H. DAVIS, LIMITED.—This company was registered on the 8th inst., with a capital of £5,000., in £1. shares, to take over the business of A. H. Davis, 40, Old Hall-street, Liverpool, paint manufacturer. The subscribers are:—

	Shares.
H. L. Ross, Rock Ferry, merchant	1
G. Garnett, Dale-street, Liverpool, marine superintendent	1
A. S. Godden Smith, J.P., Oxton, Cheshire	1
A. H. Davis, 40, Old Hall-street, paint manufacturer	1
W. B. Davis, 40, Old Hall-street, manufacturer's agent	1
H. L. Ross, jun., Rock Ferry, book-keeper	1
F. L. Meadows, 126, Huskisson-street, Liverpool, salesman	1

ANGLO-SERVIAN EXPLORATION COMPANY, LIMITED.—This company was registered on the 9th inst., with a capital of £300,000., divided into 300 founders' shares, of £10. each, and 297,000 shares, of £1. each, to acquire concessions about to be granted by the Government of Servia, relating to mineral lands in the Podgora mining territory, Province of Valjevo, Servia, for which an agreement with Charles Dickson Inglis, and the London and Colonial Finance Corporation, Limited, will be adopted. The subscribers are:—

	Ord. Shares.
The Hon. H. A. Stanhope, Overton, Hants	1
C. Mijatovitch, 14, Campden-grove, Kensington, late Servian minister	1
H. Jervis Alfred, Llanbrynmair, North Wales, mine owner	1
Otto Muller, 38, Leadenhall-street, merchant	1
Capt. J. E. Hunter, R. N., 46, Lower Belgrave-street	1
Charles King, Marlborough-mansions, engineer	1
Capt. C. D. Inglis, R. N., 101, Warwick-road, Earl's-court	1

EVISSEL SYNDICATE, LIMITED.—This syndicate was registered on the 10th inst., with a capital of £2,560., in £1., shares, whereof 60 are founders' shares, to acquire and work the letters patent No. 7,454, of 1885, for an improved manufacture of saponaceous materials for washing purposes, granted to Peter Brentini. The subscribers are:—

	Shares.
A. J. Carthew, 115, Church-lane, Stoke Newington, clerk	1
H. J. R. Liversage, 45, Swinton-street, W.C., law stationer	1
W. F. Masters, 41, Holly-street, Dalston, clerk	1
F. G. Orme, 67, Tolgarth-road, West Kensington, clerk	1
G. Humphreys, 41, Brookville-road, Fulham, clerk	1
F. W. Leeks, 18, Landcroft-road, East Dulwich, accountant	1
E. W. Branton, 8, Sturdy-road, Peckham, clerk	1

HENDERSON, CRAIG AND COMPANY.—This company was registered on the 4th inst., with a capital of £20,000., divided into 1,000 cumulative £10. per cent. preference shares, and 1,000 ordinary shares of £10. each, to acquire the business of Messrs. Henderson, Craig and Co., 41, Eastcheap, London; 41, Corporation-street, Manchester; and 16, Princess-street, Edinburgh, commission merchants, dealers in paper stock, chemicals, drysalteries, fish, fruit, and vegetables. The subscribers are:—

	Shares.
R. McKay, 3, Lothbury, chartered accountant	1
W. H. Walker, Finchley	1
J. Young Henderson, 41, Eastcheap, merchant	1
C. Taylor Craig, 41, Eastcheap, merchant	1
A. W. Maxwell, 41, Eastcheap, clerk	1
G. Maupoint, 41, Eastcheop, clerk	1
A. Schmidt, 41, Eastcheap, book-keeper	1

London Metallurgical Company, Limited.—This company was registered on the 9th inst., with a capital of £15,000, in £10. shares, to acquire certain inventions (not specified), upon terms of an agreement to be entered into with Cowper Bickerton Cowper Coles, and Sherad Osborne Cowper Coles. The subscribers are:—

	Shares.
A. G. Ogan, 383, Mare-street, Hackney, secretary	1
G. Clayton, 9, Hollywood-villas, Southwood, S.W., secretary	1
W. M. Gower, Woodside, Surrey, secretary	1
J. S. Waterfield, 17, De Vere-gardens, Kensington	1
H. W. Payne, 26, Cornhill, solicitor	1
Henry Lattey, 26, Cornhill, solicitor	1
H. Slater, 16, Tokenhouse-yard, stock-broker	1

Patent Power Filtering Company, Limited.—This company was registered on the 8th inst., with a capital of £8,080., divided into 800 ordinary shares of £10. each, and 80 founders' shares of £1. each, to acquire and work certain British and Foreign patents, granted to Herbert Fitzroy Clayton and G. H. Holroyd, for an approved method of filtering, and apparatus therefor. The subscribers are:—

	Ord. Shares
H. F. Clayton, Lockwood, Huddersfield, drysalter	1
G. H. Holroyd, Lockwood, Huddersfield, drysalter	1
J. Haigh, Colne-road, Huddersfield, cloth finisher	1
A. L. Jordan, Dalton, Huddersfield, woollen manufacturer	1
H. Ellison, Cleckheaton, tar distiller	1
F. A. Shaw, C. A., Queen-street, Huddersfield	1
R. Baines, Horbury, near Wakefield, woollen manufacturer	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

Tanner and Gardner, Loughton, lime, cement, and brick merchants.

Scotch Sequestrations.

A. J. Donaldson, W. A. Munro, and H. Donaldson, under the style of Donald son & Co, Hawick, oil distillers, December 19th, at 2, Dowell's Rooms, Edinburgh.

THE BANKRUPTCY ACT, 1883.

Receiving Orders.

Light, Henry, Lambeth Walk, Lambeth, London, oil and colourman.
Souter, Edwin, Dorking, mineral waters manufacturer.

Adjudications.

Hill, Andrew Hawksley, trading without a partner as Green, Hill & Co., Fairfield and Liverpool, whiting and acid merchant.

Orders made on Applications for Discharge.

Ashe, F., Carnaby-street, Soho, oil and colourman. Discharge suspended for six months.

The Patent List.

This list is compiled from Official sources in the Manchester Technica Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Water Filtration. B. Ray. 19,512. Dec. 1.
Water-proofing Paper. F. L. Leech and A. Horrobin. 19,523. Dec. 1.
Manufacture of Hollow Glass Ware. D. Rylands. 19,532. Dec. 1.
Smoke Consumption. J. Wilson. 19,543. Dec. 1.
Apparatus for Evaporating Liquids. J. Kirkaldy. 19,550. Dec. 1.
Manufacture of Illuminating Gases. V. B. Lewes and W. W. Staveley. 19,553. Dec. 1.
Manufacturing Iron.—(Complete Specification.) W. P. Hopkins. 19,572. Dec. 1.
Compound of Antipyrine and Iodine. O. Imray. 19,576. Dec. 1.
Fire-proof Fabric. L. Allard. 19,579. Dec. 1.
Applicances for Automatically Supplying Fuel to Pottery Kilns, etc. F. Beech and H. B. Dixon. 19,599. Dec 2.
Filtering Apparatus. E. Martin. 19,600. Dec 2.
Treatment of Sewage and Water Purification. R. S. Brownlow. 19,628. Dec. 2.
Metallic Cement. T. Smith and J. B. Hamond. 19,646. Dec. 2.
Photographic Baths. H. H. Lake. 19,672. Dec 2.
Filters. T. Atkins. 19,721, Dec. 3.
Purification of Smoke and Collection of Bye-products. W. C. Owston. 19,732. Dec. 3.
Photographic Flash Lamps. R. Slingsby. 19,733. Dec 2.
Manufacture of Iron and other Metals. J. W. Johnson. 19,734. Dec. 3.
Vessels for Boiling, Washing, and Bleaching.—(Complete Specification.) A. Hart. 19,736. Dec 3.
Photographic Cameras. C. H. Baines. 19,738. Dec. 3.
Reducing Haloid Mineral Ores. G. W. Hart. 19,756. Dec. 4.
Destructors. W. H. Mellor. 19,764. Dec. 4.
Manufacture of Chlorine. J. Simpson. 19,776. Dec. 4.
White Lead. W. Smith and W. Elmore. 19,784. Dec. 4.
Ferrate of Sodium and Caustic Soda. M. Netto. 19,792. Dec. 4.
Annealing Glass. A. T. Wedelin. 19,798. Dec. 4.
Production of Chlorine. F. M. Lyte and O. J. Steinhart. 19,815. Dec. 4.
Vaporisation of Liquids.—(Complete Specification.) H. J. Allisen. 19,835. Dec. 5.
Extraction of Gold and other Metals. R. Nahnsen. 19,875. Dec. 5.
Machines for Wool Scouring and Washing. J. McNaught and W McNaught. 19,878. Dec. 5.
Manufacture of Gas. J. Love. 19,888. Dec. 5.
Grinding Apparatus. R. Wotherspoon. 19,891. Dec 6.
Extraction of Gold and Silver. W. D. Bohm. 19,940. Dec. 6.
Production of Aromatic Hydrocarbons from Coal Tar Oils. W. W. Staveley. 19,943. Dec. 6.
Smelting Fatty Substances by Means of Hot Air.—(Complete Specification.) P. Wild. 19,960. Dec. 6.

IMPORTS OF CHEMICAL PRODUCTS
AT
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending Dec. 6th.

Antimony Ore—		
France,	33 t.	H. Emanuel
Portugal,	78	"
"	6	Blagdon & Prince
Austria,	5	Type & King
Sydney,	18	H. Bath & Son
"	8	"
"	30	"
Pt. Douglas,	1	W. Balchin
Alumina Sulphate		
Germany,	£650.	R. W. Greeff & Co.
Alum—		
Holland,	45 pks.	Ohlenschlager Bros.
Aceton—		
Holland,	£90	C. S. Lovell
"	90	"
Acetic Acid—		
Holland,	10 pks.	C. S. Lovell
"	23	Phillipps & Graves
Holland,	£125.	Beresford & Co.
Barytes—		
Holland,	44 cks.	W. Harrison & Co.
Germany,	45	"
"	10 bgs.	H. Lambert
Belgium,	50	H. A. Litchfield & Co
"	50	Arnati & Harrison
Germany,	24 cks.	O'Hara & Hoar
Brimstone—		
Italy,	5 t.	F. & L. Sibgler
"	10	J. Kitchin, Ltd.
"	2	G. S. N. Co.
Brimstone—*continued.*		
"	24 t.	A. B Curtis & Co.
"	100	Soundy & Son
"	150	B. Jacob & Sons
Copper Ore—		
Sweden,	23 c.	Vivian & Sons
Caustic Potash—		
Belgium,	6 pks.	Petri Bros.
Cream of Tartar—		
Holland,	8 pks.	Middleton & Co.
France,	9	B. & F. Wf. Co.
"	9	W. C. Bacon & Co.
"	5	M. Ashby, Ltd.
Spain,	11	B. & F. Wf. Co, Ltd.
"	10	W. C. Bacon & Co.
Caoutchouc—		
Zanzibar,	36 c.	Anderson, Weber. & Smith
Germany,	47	L. & I. D. Jt. Co.
"	6	W. M. Smith & Sons
E. Indies,	17	L. & I. D. Jt. Co.
Tamatave,	57	"
Portugal,	6	Knowles & Co.
Zanzibar,	17	Clarke & Smith
"	6	L & I. D. Jt. Co.
Madagascar,	3	Hale & Son
U. States,	5	Rosing, Bros., & Co.
"	11	Price, Hickmann, & Co.
"	35	Mildred, Goyeneche, & Co.
Germany,	5	Steible Bros.
France,	15	L. & I. D. Jt. Co.
Tamatave,	29	Gellatly & Co.
Germany,	310	Prop. Bull's Wf.
Chemicals *(otherwise undescribed)*		
Germany,	£14.	Crayen & Co.
"	38	T. H. Lee
"	300	"
Belgium,	24	"
Germany,	54	"
"	112	"
"	1,250	A. & M. Zimmermann
France,	40	Flageollet & Co.
Germany,	33	B. Kuhn
Dyestuffs—		
Saffron		
Spain,	1 pks.	P. W. Hore
"	1	Burgoyne, Burbidge, & Co.
"	1	J. H. Fox & Co.
"	1	Hodgkinson & Treacher
Italy,	1	C. Brumler
Spain,	2	B. & N. Wvs. Co.
"	1	W. J. Bush & Co.
Gambier		
Singapore,	433 pks.	W. H. Cole & Co.
"	230	H. Lambert
"	845	L. & I. D. Jt. Co.
"	347	Hoare, Wilson, & Co
Extracts		
U. States,	5	W. A. Young
Denmark,	3	G. Scrutton & Co.
Germany,	23	Forbes, Abbott, & Co.
U. States,	40	Williams, Torrey, & Co.
"	25	L. J. Levinstein & Sons
Belgium,	30	"
Annatto		
E. Indies,	118	Hoare, Wilson & Co.
Dyestuffs—*continued.*		
Myrabolams		
E. Indies,	57 pks.	Hoare, Wilson & Co.
Argols		
Holland,	54	Hale & Son
France,	50	B. & F. Wf. Co., Ltd.
Cape Town,	21	Hale & Son
Italy,	235	B. Jacob & Sons
Indigo		
E. Indies,	29 chts.	L. & I. D. Jt. Co.
Guatemala,	46	"
E. Indies,	46	"
"	32	Arbuthnot, Latham, & Co.
"	9	Benecke, Sochay, & Co.
"	17	Ross & Deering
Holland	1	Ripley, Roberts, & Co.
E. Indies,	4	L. & I. D. Jt. Co
"	6	"
"	15	W. Brandt, Sons & Co.
"	6	J. Owen
"	5	Ross & Deering
"	13	Arbuthnot, Latham, & Co.
Valonia		
Greece,	45 t.	Papyanni & Jeremias
Anthracene		
Holland,	49 pks.	Burt, Boulton, & Co.
Cochineal		
Canaries,	17	Swanston & Co.
"	9	Price, Hickmann, & Co.
"	19	W. M. Smith & Sons
Las Palmas,	4	Patry & Pasteur
Canaries,	9	Johnson, Rolls, & Co.

Dyestuffs—*continued.*
Cutch
E. Indies, 567 pks. Arracan & Co., Ltd.
Turmeric
E. Indies, 10 L. & I. D. Jt. Co.
Aniline—
Japan, 5 J. Batt & Co.
Sumac
Italy, 25 Sawer, Mead, & Co.
" 30 M. D. Co.
" 300 J. Kitchin, Ltd.
" 250 G. Lewis
" 30 Dunlop, Bros., & Co.
Tanners' Bark
Belgium, 21 t. Bevington & Sons
" 12 T. H. Lee
E. Indies, 31 Magee, Taylor, & Co.
Belgium, 10 T. H. Lee
" 20 Bevington & Sons
" 20 "
" 2 T. H. Lee
" 27 G. J. N. Co.
Melbourne, 22 Baxter & Hoare

Glucose—
Germany, 450 pks. 550 cwts. J. Barber & Co.
" 61 533 T. M. Duche & Sons
France, 300 300 J. Barber & Co.
" 150 150 Barrett, Tagant, & Son
" 68 68 Soundy & Son
Germany, 20 174 M. D. Co.
" 20 175 Dutrulle & Co.
U. States, 100 556 L. Sutro & Co.
" 30 165 T. M. Duche & Son
" 50 275 Pillow, Jones, & Co.
" 20 120 Botolph & Nicks Whvs. Co., Ltd.
" 20 174 J. Barber & Co.
" 100 600 F. J. Warren
" 50 300 G. H. Thomas
" 50 280 Page, Son, & East
" 250 250 R. G. Hall & Co.
" 75 410 F. J. Warren
" 100 100 J. Barber & Co.
U. States, 35 192 L. Sutro & Co.
" 50 275 Barrett, Tagant & Co.
France, 500 500 Dutrulle, Solomon & Co.
Holland, 150 150 J. Barber & Co.
Germany, 15 120 M. D. Co.
" 10 90 Prop. Sun's Wf.
" 100 109 Union Lighterage Co., Ltd.
" 25 220 Fellows, Morton & Co.
U. States, 50 300 R. G. Hall & Co.
" 620 620 L. Sutro & Co.

Gutta Percha—
Germany, 93 c. Soundy & Son
Holland, 30 "

Glycerine—
Germany £145 Beresford & Co.
Holland, 300 J. Barber & Co.
" 58 G. Rahn & Co.
Germany, 237 Craven & Co.
" 100 H. Lambert
Holland, 80 G. Rahn & Co.
Germany, 53 A. & M. Zimmermann

Isinglass—
E. Indies, 25 pks L. & I. D. Jt. Co.
Singapore, 3 W. M. Smith & Sons
N. Russia, 2 M. D. Co.
E. Indies, 14 Clarke & Smith
Penang, 7 L. & I. D. Jt. Co.
Holland, 1 Gillespie, Bros., & Co.
" 11 L. & I. D. Jt. Co.
China, 1 "

Manganese Ore—
Japan, 229 t. Matheson & Co.

Manure—
Belgium, 180 t. A. Hunter & Co.
" 215 London Manure Co.
France, 100 J. Burnett & Sons
Montreal, 110 Couper, Millar, & Co.
U. States, 3 C. A. & H. Nichols
Holland, 50 Lawes Manure Co.
Germany, 158 Agricl. & Horticl. Association, Ltd.

Naptha—
Belgium, 23 drs. Stein Bros.
Holland, 1 ck. Lister & Biggs

Pyrites—
Spain, 600 t. Anderson, Anderson, & Co.
La Laja, 300 G. Ward & Sons

Plumbago—
E. Indies, 234 cks. R. G. Hall & Co.
" 155 Doulton & Co.
China, 62 Le Tener & Co.
Holland, 107 Brown & Elmslie
Japan, 50 pks. F. Beyer
China, 83 brls. L. & I. D. Jt. Co.
Germany, 68 Prop. Scott's Wf.

Pitch—
Germany, 40 cs. H Lambert
N. Russia, 655 brls. C. S. Lovell
France, 68 H Hill & Sons

Paraffin Wax—
U. S. 200 brls. Mordaunt Bros.
" 388 H. Hill & Sons
" 105 Rose, Wilson, & Co.

Potassinm Chlorate—
Germany, 10 pks. Gellatly, Hankey, & Co.

Potassium Sulphate—
France, 21 pks. Martin, Perlo, & Co.
Holland, 10 H. Lambert
Germany, 1,016 bgs. Ang. Cont. G. Wks.
Montreal, 16 M. D. Co.

Potashes—
Montreal, 120 c. Charles & Fox

Pearl Ashes—
France, 100 c. Petri Bros.
Montreal, 53 Charles & Fox

Saltpetre—
Belgium, 20 cs. Becker & Ulrich
" 1 ck. Arati & Harrison
Germany, 60 cks. J. Hall & Son
" 85 P. Hecker & Co.
E. Indies 322 bgs. L. & I. D. Jt. Co.

Sodium Silicate—
Germany, 18 pks. Beresford & Co.
" 18 C. Price & Co.

Sodium Acetate—
France, 50 pks. Barr, Moering & Co.
" 50 Prop. Hay's Wf.

Sodium Sulphite—
Belgium, 17 pks W. Balchin

Sodium Nitrate—
Germany, 2 cks. H. Lambert

Sodium Sulphate—
Belgium, 16 pks. G. Haller & Co.

Sodium Carbonate—
Holland,, 1,220 pks. South Devon Wf. Co., Ltd.

Sugar of Lead—
Germany, £250 Beresford & Co.

Tar—
N. Russia, 1,300 brls. Linck, Moeller & Co.

Turpentine—
Germany, 40 brls. Linck, Moeller, & Co.

Tartars—
Italy, £1,125 Seager, White & Co.
" 1,600 Thames S. S. Co., Ltd.

Ultramarine—
Holland, 10 cs. Seaward Bros.
Belgium, 4 cks. Leach & Co.
Holland, 3 cs. Little & Johnson

Verdigris—
France, £45 C. Brumler

Zinc Oxide—
Holland, 291 cks. M. Ashley, Ltd.
Germany, 30 Hernu, Peron, & Co.
Holland, 75 M. Ashley, Ltd.

LIVERPOOL.

Week ending December 9th.

Acids *(otherwise undescribed)*—
Havre, 24 pks. Cunard S.S. Co., Ltd.

Bones—
Boston, 172 sks.
Boston, 133 bgs.
Bombay, 344

Barytes—
Antwerp, 21 cks.

Borate of Lime—
Valparaiso, 1,310 sks.

Caoutchouc—
Addah, 4 cks. W. J. Rodatz & Co.
" 2 Pickering & Berthoud

Caoutchouc—*continued.*
Winnebah, 24 cks. F. & A. Swanzy
Adjuah, 2 brls. "
" 1 cs. 1 Pitt Bros.
Accra, 6 cks. 5 pks. F. & A. Swanzy
" 2 Radcliffe & Durant
" 8 Pickering & Berthoud
" 20 S. Albrecht & Co.
" 3 brls. 2 Hutton & Co.
Salt Pond, 2 cs. Radcliffe & Durant
" 4 brls. 1 cs. 2 pks. Edwards Bros.
" 4 2 bxs. 2 Pickering & Berthoud
" 5 W. Griffiths & Co.
" 19 Miller Bros. & Co.
" 5 Millerson & Co.
" 3 pks. Symington & Co.
" 2 F. & A. Swanzy
" 1 brl. W. Duff & Co.
C. C. Castle, 8 W. Woodin & Co.
" 7 Edwards Bros.
" 2 H. B. W. Russell
" 1 Mordaunt Bros.
" 7 Millerson & Co.
" 1 Challenor & Co.
" 1 Davies, Robinson & Co.
" 5 C. L. Clare & Co.
" 8 Fletcher & Fraser
" 4 L. Hart & Co.
" 3 Slutchburg & Son
" 14 W. B. McIvor & Co.
" 5 Ellis & Co.
" 6 T. & Co.
" 1 F. J. Eaton & Son
" 8 Radcliffe & Durant
" 16 cs. 1 Taylor, Laughland & Co.
" 4 F. & A. Swanzy
" 1 Henrichsen & Co.
" 2 Miller Bros. & Co.
" 1 cs. Pickering & Berthoud
" 10
Sierra Leone, 51 Pickering & Berthoud
" 20 Waterhouse & Sons
Pernambuco, 6 Fry, Meirs & Co.
" 2 32
Rangoon, 131 bgs.

Charcoal—
Rouen, 272 bgs. Co-op. W'sale Scty., Ld.

Copper Ore—
Galveston, 3,963 bgs.
Lisbon, 20 brls.

Chemicals *(otherwise undescribed)*
Rouen, 65 cks. Co-op. W'sale. Scty., Ld.

Dyestuffs—
Logwood
Belize, 115 t. Gonzalez, Dyass & Co.
Sumac
Palermo, 1,150 bss.
" 435 bls.
Cochineal
Gr. Canary, 11 bgs. Swanston & Co.
Cutch
Rangoon, 217 bxs. W. Brandt, Sons & Co.
" 970
Valonia
Patras, 244 bgs. P. V. Mamachi, & Co.
" 1,100 G. V. Spiropulo
Dragarmestic, 2,932 "
" 3,400
Argols
Oporto, 23 cks. Ger. Bank of London
Extracts
New York, 50 pks.

Glycerine—
Rotterdam, 10 crbys.
Amsterdam, 15 cs.

Guano—
Huanillos, 1,306 t.

Glucose—
Dunkirk, 180 bgs.
Rouen, 5 cks. Co-op. W'sale Scty., Ld.

Isinglass—
Para, 37 cs. Bieber & Co.
" 11 W. Hooton & Yates

Iodine—
Valparaiso, 70 brls. A. Gibbs & Sons

Manganese Ore—
Gothenburg, 150 t. Macqueen Bros.

Manganese—
Antwerp, 2 cks.
Rotterdam, 14

Oxalic Acid—
Rotterdam 6 cks.

Pyrites—
Huelva, 1,423 t. Matheson & Co.
" 1,120 "
" 1,508 "
" 2,015 "

Pitch—
Rotterdam, 13 cks.

Phosphate—
Antwerp, 3,000 bgs. J. F. Fletcher & Co.
Montreal, 283 t. The Phosphate Co., Ld.
Ghent, 4,170 bgs. J. T. Fletcher & Co.

Phosphoric Acid
Bremerhaven, 11 bskts.

Potash—
Rouen, 17 cks. Co-op. W'sale. Scty., Ld.

Paraffin Wax—
Rangoon, 558 bxs.

Sodium Acetate—
Rouen, 9 cks. Co-op. W'sale Scty. Ld

Saltpetre—
Hamburg, 54 cks.

Soda—
Rotterdam, 25 brls.

Sugar of Lead—
Rotterdam, 27 cks.

Sulphur—
Catania, 100 bgs.
Palermo, 100

Soda Salts—
Bordeaux, 3 cks.

Stearine—
Rouen, 5 bgs. Co-op. W'sale. Scty., Ld.
Bordeaux, 12 cs.

Soap—
Baltimore, 200 bxs.
Bordeaux, 20 cs 6 bdls.

Verdigris—
Bordeaux, 5 cks.

Zinc Oxide—
Antwerp, 100 brls.

Zinc Ashes—
Antwerp, 8 cks. J. T. Fletcher & Co.

HULL.

Week ending December 11th.

Acids *(otherwise undescribed)*
Rotterdam, 1 ck. G. Lawson & Sons

Albumen—
Hamburg, 17 cks. Wilson, Sons, & Co.

Bicarbonate—
Rotterdam, 1 ck.

Barytes—
Rotterdam, 23 cks.
Antwerp, 81 Bailey & Leetham
Bremen, 46 Tudor & Sons

Chemicals *(otherwise undescribed)*
Dunkirk, 86 pks. Wilson, Sons, & Co.
Hamburg, 14 2 cks. " "
Antwerp, 36 " "
Bremen, 1 cs. Veltman & Co.
" 5 Wilson, Sons, & Co.
" 1 kg. Sissons Bros.
" 1 ck. J. Pyefinch & Co.

Dyestuffs—
Alizarine
Rotterdam, 64 brls. G. Lawson & Sons
" 47 cks. Hutchinson & Son
" 48 pks. W. & C. L. Ringrose
" 7 cs. 88 cks. Hutchinson & Son
Logwood
Hamburg, 30 bgs. Wilson, Sons, & Co.
Divi divi
Hamburg, 15 bgs. Wilson, Sons & Co.
Sumac
Palermo, 546 bgs. Wilson, Sons, & Co.
" 300
Glycerine—
Rotterdam, 6 drms. G. Lawson & Sons
Graphite—
Hamburg, 102 cks.
Glucose—
Stettin, 10 cks Wilson, Sons, & Co.
" 800 bgs. C. M. Lofthouse & Co.
Gypsum—
Bremen, 14 bgs. J. Pyefinch & Co.
Naphthol—
Rotterdam, 11 cks. Hutchinson & Son
Pitch—
Amsterdam, 13 cks. H. F. Pudsey
Stettin, 33
Plumbago—
Hamburg, 17 cks. Furley & Co.
" 2 F. B Grotrian
" 5 Todd & Son
" 12
Hamburg, 9 M. S. & L. Rly. Co.
Soda—
Rotterdam, 50 cks. G. Lawson & Sons
Soap—
Hamburg, 1 cs. Bailey & Leetham
Saltpetre—
Hamburg, 2 cks.
Sugar of Lead—
Hamburg, 12 cks.
Stearine—
Rotterdam, 51 bls. G. Lawson & Sons
Sulphur—
Catania, 613 pks. Wilson, Sons, & Co.
Tar—
Hamburg, 1 brl. Wilson, Sons, & Co.
Ultramarine—
Rotterdam, 2 cks. G. Lawson & Sons
White Lead—
Rotterdam, 10 cks. Blundell, Spence, & Co.
" 27
Antwerp, 3 Bailey & Leetham
" 56 " "
Waste Salt—
Hamburg, 508 bgs. Furley & Co.

GOOLE.

Week ending December 31d.

Antimony—
Boulogne, 1 ck.
Caoutchouc—
Boulogne, 4 cks.
Chrome Alum—
Rotterdam, 20 cks.
Chemicals *(otherwise undescribed)*
Rotterdam, 3 cks.
Dyestuffs—
Alizarine
Rotterdam, 34 cks.
Dyetuffs *(otherwise undescribed)*
Boulogne, 33 cks. 3 cs.
Glucose—
Dunkirk, 100 bgs.
" 50
Phosphate—
Ghent, 90 t.
Potash—
Dunkirk, 59 drms.
Saltpetre—
Rotterdam, 100 bgs.
Hamburg, 14 cks.
Antwerp, 100
Waste Salt—
Hamburg, 508 bgs. 975 cks.
" 100 t. 394

TYNE.

Week ending Deeember 10th.

Alum Earth—
Hamburg, 18 cks. Tyne S. S. Co.
Copper Precipitate—
Pomaron, 4,476 bgs. Mason & Barry
Glucose—
Rotterdam, 40 bgs. Tyne S. S. Co.
Saltpetre—
Hamburg, 9 cks. Tyne S. S. Co.
Sulphur Ore—
Pomaron, 1,050 t. Mason & Barry
Zinc Oxide—
Antwerp, 20 brls. Tyne S. S. Co

GLASGOW.

Week ending December 11th.

Barytes—
Antwerp, 85 bgs.
Rotterdam 33 cks.
" 158 J. Rankine & Son
Chemicals *(otherwise undescribed)*
Hamburg, 4 cs. 1 ck.
Dyestuffs—
Alizarine
Rotterdam, 141 cks. J. Rankine & Son
" 2 cs. 29
Cutch
Hamburg, 2 cs.
" 2
Dyestuffs—*continued.*
Extracts
Antwerp, 45 cks. 1 cs.
New York, 6 brls.
Glycerine—
Rotterdam, 11 cs. J. Rankine & Son
Glucose—
New York, 100 brls.
Manganese Ore—
Bordeaux, 100 t.
Potash—
Rotterdam, 19 cks. J. Rankine & Son
Phosphates—
Antwerp, 100 t.
Montreal, 72 t.
Soda—
Rotterdam, 200 kgs. J. Rankine & Son
Salammoniac—
Rotterdam, 1 ck. J. Rankine & Son
Tartar—
Bordeaux, 14 cks.
" 12
Ultramarine—
Antwerp, 13 cs.
White Lead—
Rotterdam, 48 cks.
" 27
Waste Salt—
Hamburg, 366 cks.
Zinc Oxide—
Antwerp, 60 brls.
New York, 100 brls.
Hamburg, 35 cks.
Zinc Ashes—
Bordeaux, 33 t. 44 bgs.

GRIMSBY.

Week ending December 6th.

Albumen—
Dieppe, 30 cks.
Antwerp, 16 pks.
Zinc Ashes—
Antwerp, 8 cks.

EXPORTS OF CHEMICAL PRODUCTS
OF
THE PRINCIPAL PORTS OF THE UNITED KINGDOM.

LONDON.

Week ending December 3rd.

Alum Cake—
Calcutta, 17 t. 3 c. £76
Acetic Acid—
B. Ayres, 13 c. £26
Ammonium Sulphate—
Hamburg, 50 t. 16 c. £560
" 3,699 3,975
Ammonium Carbonate—
B. Ayres, 15 c. £28
Yokohama, 2 t. 76
B. Ayres, 8 16
Ammonia—
Hong Kong, 4 cs. £107
Rosario, 30 48
B. Ayres, 9 c. 25
Rotterdam, 12 drs. 21
B. Ayres, 9 33
Arsenic—
Napier, 2 t. £30
Yokohama, 10 c. 8
Wellington, 2 31
Acids *(otherwise undescribed)—*
Natal, 6 cs. £12
Demerara, 1 33
Freemantle, 3 14
Cologne, 220 drs. 350
Alum—
Cape Town, 2 t. £16
St. Lucia, 2 14
Bisulphide of Carbon—
Rotterdam, 5 t. 2 c. £67
Rio de Janeiro, 3 10 78
Brimstone—
St. Lucia, 30 brls. £37
Boracic Acid—
B. Ayres, 9 c. £20
M. Video, 5 cks. 11
Bleaching Powder—
Calcutta, 10 t. £90
Borax—
Natal, 2 cks £14
Cologne, 10 cs. 38
Hamburg, 1 t. 1 c. 60
Adelaide, 10 15
Coal Products—
Naphthaline
Libau, 3 cks. £16
Le Treport, 55 45
Aniline Salts—
Barcelona, 36 pks. 600
Adelaide, 1 cks. 34
Pitch
Genoa, 1,371 t. £2,399
Leghorn, 252 10 c. 340
Dunkirk, 482 733
Naples, 50 cks. 20
Dunkirk, 175 267
Salonica, 75 brls. 23
Barcelona, 2 14
Benzol
Rotterdam, 18 cks. 32 drs.
" 50 pns. £1,740
Yokohama, 5 drs. 13
Treport, 12 pns. 350
" 12 cks. 340
Rotterdam, 20 87 pks. 1,035
" 48 451
Anthracene
Dusseldorf, 58 cks. £417
Rotterdam, 75 300
" 504 4,370
Dusseldorf. 32 810
" 154 1,318
Cologne, 90 900
Rotterdam, 81 612
Naphtha
Natal, 20 drs. £14
Calais, 3 cks. 18
Treport, 52 200
Tar
Rio de Janeiro, 30 rlts. £16
Carbolic Acid Gas—
Bordeaux, 18 tubes £40
Charcoal— 4
Dunkirk, 40 t. 15 c. £208
Citric Acid—
M. Video, 1 ck. £35
Hamburg, 2 kgs. 16
Constantinople, 1 8
Yokohama, 5 c. 35
Hamburg, 1 t. 140
Sydney, 1 7
Reval. 10 kgs. 73
Hamburg, 2 cks. 42
Copenhagen, 4 29
Malmo, 2 15
Carbolic Acid—
New York, 20 cs. £130
Port Nolloth, 2 t. 5 c. 22
Bombay, 7 pks. 8
Marseilles, 157 cks. 1,698
New York, 60 cs. 200
Rotterdam, 11 15 152
Dusseldorf, 14 3 915
Hamburg, 6 8 311
Antwerp, 23 drs. 392
Cream of Tartar—
Auckland, 10 c. £49
Wellington, 1 t. 101
Melbourne, 1 1 100
Caustic Soda—
Calcutta, 35 t. £368
Cape Town, 13 10
Sydney, 15 13 196
Algoa Bay, 1 3 63
Copper Sulphate—
Freemantle, 1 t. 9 c. £32
Marseilles, 5 95
Barcelona, 9 17 180
Sydney, 10 12
Cape Town, 5 5
Adelaide, 5 93
Launceston, 1 10 30
Chemicals *(otherwise undescribed)*
Melbourne, 2 c. £13
Madrid, 16 130
Natal, 2 cks. 20
Sydney, 10 cs. 10
Auckland, 4 kgs. 26
New York, 6 63
Adelaide, 1 12
Chemicals—*continued*
Bombay, 20 drs. £15
Rangoon, 6 cs. 57
St. Lucia, 11 60
Halifax, 3 11
Trinidad, 1 14
Adelaide, 3 26
" 2 kgs. 65
Disinfectants—
Brisbane, 8 cks. £36
Melbourne, 84 cs. 93
Sydney, 3 12
Ehrmanite—
Martinique, 2 t. 4 c. £60
Guano—
Landerneau, 180 t. £1,800
Auckland, 25 250
Gold Chloride—
Hong Kong, 1 cs. £9
Glycerine—
New York, 6 cs. £20
" 9 c. 70
Auckland, 4 12
B. Ayres, 10 28
Rouen, 15 t. 2 300
Hydro Carbon—
Ghent, 13 drms. £17
Brussels, 3 t. 15 c. 60
Insect Powder—
Rio de Janeiro, 1 cs. £7
Magnesium Carbonate—
B. Ayres, 10 c. £19
Magnesia—
Genoa, 14 c. £28
B. Ayres, 8 43
Paris, 1 t. 9 93
Manure—
Motril, 143 t. 15 c. £1,205
E. London, 20 270
Hamburg, 201 10 2,413
Bardadoes, 20 180
Martinique, 50 300
Demerara, 9 95
Singapore, 83 8 666

Manure—*continued.*
Ghent, 100 t. £1,200
St. Lucia, 10 20
Martinique, 75 1 c. 250
Antwerp, 200 1,400

Oxalic Acid—
Rosario, 1 ck. £8
Paris, 5 t. 170

Potash—
Gothenburg, 5 kgs. £12

Pyrogallic Acid—
Hong Kong, 2 c. £8

Potassium Prussiate—
New York, 2 t. 10 c. £200
B. Ayres, 4 20
Yokohama, 10 44

Phosphorus—
Hiogo, 18 c. £217

Potassium Chlorate—
Melbourne, 1 t. £49
Hiogo, 200 kgs. 449
New York, 120 270

Soda Ash—
Townsville, 5 t. 4 c. £34

Superphosphate—
Auckland, 10 t. £40

Silver Nitrate—
Hong Kong, 1 cs. £108

Soap Lyes—
Rotterdam, 11 t. 2 c. £250

Sodium Bichromate—
B. Ayres, 17 c. £21

Sulphur Flowers—
E. London, 200 pks. £120

Sulphur—
Rosario, 1 t. 5 c. £28
Philadelphia, 2 69

Spent Oxide—
Hamburg, 105 t. £100
" 204 15 c. 452
Dunkirk, 102 67

Soda & Lime Salts—
Boston, 5 kgs. 3 cs. £86

Sheep Dip—
Lyttleton, 2 pks. £20
Cape Town, 10 cs. 28
Sydney, 110 170
B. Ayres, 3 t. 11 c. 88
Natal, 17 cs. 36
Wellington, 150 265
Timarn, 15 dms. 20
Dunedin, 30 40
Otago, 23 30
Bona, 40cks. 180
E. London, 150 40
Pt. Elizabeth, 86 174
New York, 300 640

Sugar of Lead—
Yokohama, 1 t. 5 c. £30

Sodium Bicarbonate—
Melbourne, 2 t. 5 c. £20
Algoa Bay, 1 10 10
Freemantle, 1 7 9

Saltpetre—
Vigo, 3 t. 15 c. £80
Rio de Janeiro, 5 9 121
Natal, 10 10
Rotterdam, 1 22

Sodium Tartrate—
Brussels, 5 c. £22

Salammoniac—
Stockholm, 7 c. £14
Batoum, 1 t. 35

Tartaric Acid—
Algoa Bay, 1 c. £8
Freemantle, 2 16
Adelaide, 5 35
" 18 115
Melbourne, 12 66

Zinc Oxide—
Philadelphia, 2½ c. £14

LIVERPOOL.

Week ending Dec. 6th.

Alkali—
Boston, 74 tcs.
San Sebastian, 9 22 brls.
Seville, 50
Smyrna, 100
Sydney, 40

Antimony Regulus—
Gijon, 10 c. £41

Ammonium Muriate—
Antwerp, 9 c. 2 q. £12
Philadelphia, 13 t. 297

Ammonium Carbonate—
Lisbon, 4 c. £7
Bilbao, 6 10
Coquimbo, 5 9

Alum—
Alexandria, 3 t. 14 c. £17
" 4 6 13
Baltimore, 19 6 3 q. 219
Calcutta, 58 11 292
Constantinople, 7 9 32
Pelotas, 18 5
Gothenburg, 74 17 229
Havana, 7 11 1 25
Hevaklia, 4 4 22
Messina, 2 1 6
Syra, 2 10 7
B. Ayres, 6 4 18
Valencia, 2 5 2 6

Ammonium Sulphate—
Hamburg, 50 t. 15 c. 3 q. £375
Valencia, 31 5 1 365
Hamburg, 38 11 425
Antwerp, 9 10 108

Ammonia—
B. Ayres, 10 cs. £35
Rio de Janeiro, 4 c. 5

Bleaching Powder—
Alicante, 40 cks.
Boston, 593 227 tcs.
Genoa, 125
Ghent, 134
Havana, 20 brls. 12 cs.
New York, 523
Odessa, 15
Rio de Janeiro, 100
Taltal, 45
Bombay, 15
Boston, 80
Chicago, 5 bxs. 5 pks.
New York, 259
" 62 brls. 49
Philadelphia, 43 45 dms.
Rouen, 30 kgs.
Terneuzen, 25
Toronto, 10

Borate of Lime—
Rotterdam, 10 t. 1 c. 1 q. £110

Bone Waste—
Rouen, 18 t. 13 c. £185

Borax—
Antwerp, 2 t. £57
Lisbon, 2 1 q. 60
Rotterdam, 2 2 c. 3 59
Syra, 9 1 14
Rotterdam, 19 2 27
Santiago, 3 1 5
Matenzas, 1 12 48
Montreal, 1 12 3 49

Brimstone—
Calcutta, 24 t. 2 c. £125

Boracic Acid—
Palermo, 15 c. 1 q. £29
Genoa, 1 t. 11 1 58
Rotterdam, 2 8 87

Copper Sulphate—
Gothenburg, 1 t. 2 q. £18
Leghorn, 10 2 c. 2 180
Nantes, 39 714
Barcelona, 50 1 3 1,027
Rouen, 110 1,980
Santos, 9 10
Algiers, 5 88
Genoa, 9 8
Hamburg, 2 8 42
Tarragona, 10 1 3 185
Venice, 31 10 2 547
Barcelona, 8 2 154
Bordeaux, 4 17 25
Genoa, 118 17 2 1,846
Hamburg, 19 19 2 351
Nantes, 20 2 353
Palermo, 2 18 3 54
Christiania, 1 2 20
Constantinople, 1 18
Antwerp, 10 1 191
Barcelona, 6 1 1 102
M. Video, 2 4 42
Genoa, 11 15 210
Bordeaux, 79 19 1,495
Nantes, 156 11 1 2,957
Venice, 21 15 2 393
Brisbane, 8 10 160
Genoa, 8 15 160

Carbolic Acid—
Baltimore, 9 c. 3 q. £13
Rouen, 1 t. 1 50
Barcelona, 6 3 22
St. Louis, 4 2 1 25
New York, 3 8 2 239
" 3 174
Hamburg, 4 2 21
New York, 2 16 3 135

Caustic Soda—
Adelaide, 155 dms.
Bahia, 5
Barcelona, 100
Bari, 20

Caustic Soda—*continued.*
Boston, 455 dms.
Catania, 20
Constantinople, 2
Copenhagen, 5 cks.
Dunedin, 36
Leghorn, 36
Lisbon, 52
Madrid, 30
Melbourne, 88
New Orleans, 69
New York, 425
Odessa, 50
Philadelphia, 240
San Sebastian, 295 50 brls.
Singapore, 15
Tunis, 5
Adelaide, 9 bxs. 2 pks.
Amsterdam, 252
Ancona, 5
Antwerp, 18
Barcelona, 200
Bari, 20
Bilbao, 17 cks.
Boston, 100
B. Ayres, 40
Chicago, 50 12
Fairwater, 50
Genoa, 76
Hamburg, 10
Havre, 27
Konigsberg, 34
La Guayra, 30
Malaga, 129 pks.
Melbourne, 34
Milwaukee, 200
Montreal, 110
Naples, 15
New Orleans, 50
New York, 50 brls. 380
Oporto, 65
Pasages, 12
Philadelphia, 274
Portland, 20
Rotterdam, 94
Rouen, 30
Pt. Louis, 100
Salonica, 5
Seville, 25 kgs.
Sydney, 18
Tarragona, 40
Valencia, 20 10
Venice, 10
Vigo, 14 cks.
Wellington, 14
Singapore, 4 t. 19 c. £51

Copperas—
Constantinople, 4 t. 5 c. £9
Syra, 30 brls. 9
Taltal, 68 33
Calcutta, 32 70
Alexandretta, 20 5
Alexandria, 52 12
Constantinople, 20 6
Santos, 2 6 5
Alexandria, 16 4 30
" 4 10 9
Beyrout, 4 10 9

Caustic Potash—
Chicago, 2 t. 3 c. £125
Havana, 5 1 q. 11
" 7 8
Wellington, 1 1 25

Cream of Tartar—
Halifax, 10 c. 2 q. £51
St. Johns, Nfld., 1 5

Disinfectants—
Pernambuco, 3 cs. £6

Epsom Salts—
Bombay, 100 kgs.
Masaga, 15 brls.

Glycerine—
New York, 16 t. £800
" 18 900
" 30 1,200
Talcahuano, 48 galls. 17

Gypsum—
New York, 9 t. 12 c. £28
Boston, 14 15 44

Hydrochloric Acid—
Santos, 12 crbys. £10

Iron Oxide—
Gijou, 2 t. 9 c. 1 q. £14

Lead Nitrate—
Genoa, 10 c. £11

Magnesium Carbonate—
Mayaguay, 3 c. £5

Magnesium Chlorate—
Philadelphia, 10 c. £7

Oxalic Acid—
Barcelona, 12 c. £22
Trieste, 4 t. 18 1 q. 160
Havre, 4 18 160
Trieste, 1 35

Pitch—
Granville, 100 t.
Manila, 20 cks.

Potassium Prussiate—
Oporto, 3 c. 3 q. £17
Genoa, 2 23
" 1 10 157

Potassium Chlorate—
Boston, 10 c. £23
M. Video, 12 30
New York, 27 t. 10 1,239
Oporto, 4 10
New York, 13 625
New Orleans, 1 5 64
New York, 5 283

Phosphate—
B. Ayres, 1 cs. £8

Potashes—
Melbourne, 2 t. 14 c. £90

Sheep Dip—
Algoa Bay, 10 £20
Wellington, 19 8 3 q. 700
B. Ayres, 4 150

Sodium Nitrate—
Leghorn, 6 t. 9 c. £53

Salt Cake—
Baltimore, 140 t. 7 c. £534

Soap—
Accra, 150 bxs.
Addah, 10
Algoa Bay, 510
Antwerp, 124 cs.
Barbadoes, 1,255
Bathurst, 155
Benin, 436
Bombay, 97 cs. 2,490
Brass, 300
Coquimbo, 14
Gaboon, 50
Genoa, 100
Gibraltar, 95
Curacoa, 367
Guayaquil, 500
Las Palmas, 245
Loanda, 40
Madras, 3
Malta, 10 100
Montreal, 43 pks.
New York, 782 27 3 cks.
Oporto, 1,620
Para, 1
Piræus, 20
Port Natal, 524
Shanghai, 2,500
Singapore, 200
Teneriffe, 78
Trinidad, 1 2,670
Barbadoes, 413
Bombay, 13 8
Bonny, 40
Calcutta, 50
Cape Coast, 40 1
Gibralter, 145
Honolulu, 790
Naples, 50
Rangoon, 2
Sierra Leone, 500
Singapore, 17
Smyrna, 100
Sydney, 925
Toronto, 200
Vancouver 20
Zanzibar, 400

Soda Ash—
Adelaide, 90 brls.
Baltimore, 185 cks.
Barcelona, 10
Beyrout, 5
Boston, 86
Chicago, 92
Lisbon, 33
Maranham, 65
Naples, 2 20
New York, 894 324 tcs.
Oporto, 5
Philadelphia, 772
Rio de Janeiro, 4
Rosario, 50
Adelaide, 32
Bahia, 10
Beyrout, 5
Boston, 122
Calcutta, 7
Hamilton, 90
Melbourne, 26
Milwaukee, 57
New York, 228 58
Philadelphia, 92
Puerto Cabello, 21
Rio de Janeiro, 180
Wellington, 21

Soda Crystals—
Boston, 280 brls.
B. Ayres, 80
Calcutta, 50
Constantinople, 50
New Orleans, 156
New York, 374 kgs.
Philadelphia, 167
St. Johns, 50
Smyrna, 100
Alexandria, 30
Boston, 280
Valencia, 4 cks.

Sodium Bicarbonate—
Copenhagen, 20 kgs.
Halifax, 50 bxs.
Philadelphia, 100
Seville, 25 brls.
Venice, 20
Vera Cruz, 50
Ancona, 30
Antwerp, 120
Barcelona, 225
Boston, 100 cks.
B. Ayres, 144
Cadiz, 7
Copenhagen, 255 pks.
Dunedin, 140
" 40
Hamburg, 60
Honolulu, 50
Lisbon, 50
Rangoon, 60
Rouen, 10
Seville, 40 10
Smyrna, 60
Sydney, 100
Calcutta, 250

Sodium Carbonate—
Boston, 112 brls.
Kurachee, 56
Rotterdam, 50

Salt—
Adelaide, 75 t.
Antwerp, 448
Baltimore, 1,216
Barbadoes, 428
Bathurst, 5½
Black Point, 10
Brisbane, 223
B. Ayres, 50
Calcutta, 1,843
Chicago, 200
E. London, 18
Ghent, 216
Iborlo, 9 c.
Landana, 8
Mellacoree, 100
New York, 1,460
Portland, 185
Rio Nunez, 50
Rio Pongo, 100
Rotterdam, 344
Salt Pond, 6 5
Sandiford, 100
Sydney, 245 1
Trinidad, 24 18
Philadelphia, 300
Wellington, 10
Boston, 100
B. Ayres, 29½
Cameroons, 11
Copenhagen, 233
Savannah, 21
Manaos, 20
Manoh, 15
M. Video, 17
New Orleans, 8
New York, 8
Para, 37 14
Pt. Natal, 5
Rio de Janeiro, 6

Soap Powder—
Antwerp, 100 bxs.
Sydney, 10 t. 7 c.
Newcastle, 8 tanks.

Sodium Silicate—
Bilbao, 56 brls.

Sodium Sulphate—
Wellington, 2 t. 2 c. £16
Bahia, 13 3 q. 5

Sugar of Lead—
Santos, 1 t. 4 c. £27
Rio de Janeiro, 6 2 q. 9

Sulphur—
Rouen, 41 t. £202
Boston, 50 223
" 25 1 c. 106
Portland, 25 109
Calcutta, 1 81
Portland, 20 2 90
Boston, 30 135
Portland, 50 2 225
Halifax, 13 665
Boston, 20 85

Sodium Chlorate—
New York, 1 t. £60
" 4 15 284

Salammoniac—
Alexandria, 1 t. £33
Odessa, 1 32
Trieste, 2 1 c. 72
Alexandria, 2 cs. 28
Bari, 10 2 q. 17
New York, 9 t. 18 325
Samsoun, 4 2 9
Malta, 1 35

Sulphuric Acid—
New York, 1 t. 4 c. 1 q. £60
Rangoon, 4 9 1 56

Sodium Acetate—
New York, 5 t. 12 c. £90

Sodium Biborate—
Antwerp, 8 t. 7 c. 3 q. £252
Hamburg, 1 1 3 33
Yokohama, 3 t. 11 c. 2 q. 107

Tar—
Honolulu, 35 dms.
Ibo Ibo, 9 cks.
Manila, 215 25

Tartaric Acid—
Magog, 3 c. 2 q. £25

Zinc Chloride—
Bombay, 9 t. 11 c. 3 q. £138

TYNE.

Week ending December 10th.

Antimony—
Rotterdam, 5 t.

Anthracene—
Rotterdam, 59 t.

Alkali—
Ghent, 10 t. 17 c.
Christiania, 4 2
Copenhagen, 10

Ammonium Carbonate—
Copenhagen, 5 c.

Bleaching Powder—
Antwerp, 110 t.
" 5 21 c.
Hamburg, 17 10
Christiania, 1 14
" 5 3
Horsens, 1 8
New York, 106
Malmo, 5 1
New York, 106
Rotterdam, 14 19
" 2 4
Seville. 24 16

Blanc Fixe—
Antwerp, 4 t. 1 c.

Barytes—
New York, 50 t.
Copenhagen, 2

Barium Chloride—
Copenhagen, 1 t. 11 c.

Barytes Carbonate—
New York, 50 t.
Rotterdam, 93

Caustic Soda—
Horsens, 1 t. 10 c.
New York, 250 2
" 350 8
Seville, 34 10

Copper Sulphate—
Seville, 12 c.

Calcined Magnesia—
Seville, 8 c.

Epsom Salts—
Seville 7 t. 17 c.

Glauber Salts—
Seville, 1 t. 2 c.

Litharge—
New York. 15 c.
" 3 t. 5

Magnesia—
Antwerp, 3 q.
Hamburg, 6 c.

Potassium Chlorate—
Antwerp, 1 t.
" 2 4 c.
Hamburg, 1

Soda Ash—
Hamburg, 19 t. 14 c.
Lisbon, 6
Christiania, 3 6
New York, 94 3
" 94 3

Sulphur—
Christiania, 2 t.
" 2
" 35

Sulphur—*continued.*
Rotterdam, 50 t.
Copenhagen, 50
Gothenburg, 40

Soda—
Svendborg, 31 4 c.
Norrkoping, 108 18
Svendborg, 10 12
New York, 100 6
" 26 6
Malmo, 2 3
Aarhuus, 10 7
" 22 10
New York, 26 6
Rotterdam, 23 15
Copenhagen, 21 9

Sodium Silicate—
Seville, 2 t. 14 c.

Sodium Bicarbonate—
Aarhuns, 5 c.

White Lead—
New York, 5 t. 1 c.

HULL.

Week ending December 9th.

Alkali—
Fiume, 12 cks.

Bone Size—
Bremen, 20 cks.
Harlingen, 10
Rotterdam, 36

Borax—
Drontheim, 1 ck.
Hamburg, 34

Bleaching Powder—
Amsterdam, 10 cks.
Trieste, 22

Copper Sulphate—
Bergen, 17 cks.
Drontheim, 5

Caustic Soda—
Antwerp, 19 drms.
Libau, 234
Reval, 135 cks.
Riga, 542
Trieste, 2
Venice, 50

Chemicals *(otherwise undescribed)*
Antwerp, 13 cs. 82 cks.
Amsterdam, 31
Bergen, 20
Bremen, 20
Bari, 6
Christiania, 4 7 pks.
Copenhagen, 1 4
Gothenburg, 38 70
Hamburg, 269 261
Konigsberg, 2
Libau, 160
Messina, 3
New York, 29 52
Rotterdam, 4 15
Reval, 5
Riga 4 4
Stockholm, 1
San Francisco, 95
Stettin, 2
Trieste, 41

Dyestuffs *(otherwise undescribed)*
Antwerp, 10 cks.
Boston, 9
Dunkirk, 2 93 bgs.
Rotterdam, 3 5 pks.
Stettin, 20 cs.

Manure—
Hamburg, 191 bgs.
Stettin, 88

Naphtha—
Copenhagen, 15 cks.

Pitch—
Antwerp, 231 t.
Copenhagen, 20

Tar—
Hamburg, 10 cks.
Rotterdam, 21
Stockholm, 11

Turpentine—
Messina, 1 ck.

GRIMSBY.

Week ending December 6th.

Coal Products—
Antwerp, 5 cks.
Dieppe, 98

Chemicals *(otherwise undescribed)*
Dieppe. 8 cks.
Hamburg, 3 cs.
Rotterdam, 16 20 cks.

Pitch—
Malmo, 35 cks.

GLASGOW.

Week ending December 11th.

Ammonium Carbonate—
Christiania, 5 kgs. £10

Ammonium Sulphate—
Trinidad, 22 t. 4½ c. £271
Demerara, 55 10¼ 617

Bleaching Powder—
Brisbane, 18 t. 7 c. £103

Benzole—
Rotterdam, 48 drs. 20 pks. £1,440
" 6 £160

Bone Meal—
Demerara, 6 t. 4¼ c. £33

Brimstone—
Bergen, 51 t. £714

Charcoal—
Christiania, 1 c. 38.

Dyestuffs—
Extracts
Halifax, £260

Ferro Manganese—
Halifax, 20 t. £235

Ferro Silicon—
Halifax, 12 t. 66

Lead Nitrate—
Halifax, 2 t. 3½ c. £43

Litharge—
Boston, 7 t. £117

Magnesium—
Barcelona, 74½ c. £74

Manure—
Java, 7 t. £55

Paraffin Wax—
Nantes, 1 t. 13 c. £50
Barcelona, 243½ 445

Potassium Bichromate—
Barcelona, 98¾ c. £161
Rotterdam, 33 cks. 415
Boston, 341 c. £597
New York, 334 506
Bergen, 3 22
Antwerp, 21 t. 17¼ 146

Potassium Prussiate—
New York, £706

Pitch—
Barcelona, 599 t. 17 c. £825
Christiania, 7½ £11

Soda Salts—
Christiania, 2 cks. £4

Soda—
Chili, £30

Soap—
Batavia, 428½ c. £210
Bombay, 21¾ £14. 10s.

Sulphuric Acid—
Trinidad, 3 t. 8¼ c. £31
Chili, £29
Rangoon, 15 7 152

Sodium Bichromate—
Boston, 335 c. £429

Saltpetre
Boston, 2 t. 6¾ £55

Soda Ash—
Batavia, £84

Turpentine—
Penang, 500 gls. £57
Demerara, £45

Tar—
Penang, 65 t. 5¼ c. £315
" 14½ 101

White Lead—
Rangoon, 1 t. 15 c. £38

GOOLE.

Week ending December 3rd.

Benzole—
Rotterdam, 34 cks. 18 dms.

Bleaching Powder—
Rotterdam, 36 cks.

Coal Products—
Rotterdam, 200 cks.

Dyestuffs *(otherwise undescribed)*
Boulogne, 14 cks. 3 drms.
Ghent, 1 cs. 5

Manure—
Boulogne, 55 bgs.
Ghent, 227
Hamburg, 292

Pitch—
Antwerp, 330 t.

PRICES CURRENT.

WEDNESDAY, DECEMBER 17, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 °/₀ and 40 °/₀ .. .. per cwt.	7/- &	11/6	
,, Glacial .. .. ,,		55/-	
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 °/₀ .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 °/₀) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. ,,	1	15	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880=28° .. .. per lb.	0	0	3
,, =24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- &	35/-	
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	10	12	6
,, ,, (grey), Hull .. .. ,,	10	12	6
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11½
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	5	0
,, Carbonate (native) .. .. ,,	3	10	0
,, Sulphate (native levigated) .. .. .. ,,	45/- to	75/-	
Bleaching Powder, 35 % .. .. ,,	6	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to	35/-	
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. per gallon	0	4	8
,, 50/90 ,, ... ,,	0	3	8
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	5¾
,, (crude 60°) .. .. per gallon	0	1	6
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	11
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	16	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	11
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	54	0	0
,, Sulphate .. .. ,,	19	0	0
,, Oxide (copper scales) .. .. ,,	52	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	12	6
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	0	0
,, Litharge Flake (ex ship) .. .. ,,	15	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	15	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- &	42/6	
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	3
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	8
Oils:—			
Cotton-seed .. .. per ton	18	15	0
Linseed .. .. ,,	22	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅜
,, American .. .. ,,	0	0	5¾
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	19	15	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. per cwt.	£3 5 0 to	3 10	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	1½
,, Nitrate .. .. ,,	0	2	10
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	2	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	10	0
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	17	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	5	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	5	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	5	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	15	0
,, Bicarbonate .. .. ,,	8	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9	0	0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	7	7½
,, Nitrite, 98 % .. .. per ton	28	10	0
,, Phosphate .. .. ,,	16	0	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	6	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¼
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	15	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	27	10	0
Tin (English Ingots) .. .. ,,	96	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

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Notices.

All communications for the *Chemical Trade Journal* should be addressed, and Cheques and Post Office Orders made payable to—

DAVIS BROS., 32, Blackfriars Street, MANCHESTER.

Our Registered Telegraphic Address is—

"Expert, Manchester."

TO ADVERTISERS.

SPECIAL NEW YEAR'S NUMBER OF THE "CHEMICAL TRADE JOURNAL."

In the first week of the approaching New Year, we shall issue a Special Number of the Journal. It will be an enlarged Special Number of very general interest, and we shall issue with it a neat and useful office almanac, suitable for our subscribers.

Including our regular subscribers, the New Year's Number will be issued to **not less than 10,000 firms and individuals**, so that intending advertisers will see at once that this is worthy of their special attention. We may explain that in our publishing department we possess very carefully compiled lists—in most cases the results of special attention and information, at our command—of every firm of repute, both at home, and in the main trading centres abroad, connected with the various industries whose interest it is our province to serve. We utilize these lists week by week, by selecting a number of them and sending out free copies of the Journal to those firms who have not yet become annual subscribers. The result is that every day brings us new subscribers. We have arranged to continue this process week by week, until we arrive at what we consider our normal circulation, which we have fixed at a tolerably high figure.

On the occasion of the New Year's Special Number, we shall make use of the whole of the lists we have referred to, numbering altogether, as we have stated not less than 10,000 names.

Of course, for this special issue. there will be special prices for advertisements, but those who order a series, either commencing with that number or previously, will have the advantage of our regular tariff rates, of bringing their specialities under the notice of a very large circle of buyers.

As only a limited number of pages will be added for advertisements, early application for space is necessary. We shall be pleased to send tariff of charges to all those who may desire to advertise in this Special Number.

Advertisements.

Prepaid Advertisements of Situations Vacant, Premises on Sale or To be Let, Miscellaneous Wants, and Specific Articles for Sale by Private Contract, are inserted in the *Chemical Trade Journal* at the following rates:—

20 Words and under ..... 2s. 0d. per insertion.
Each additional 10 words ..... 0s. 6d. ,,

CAPE COPPER COMPANY, LIMITED.

THE third ordinary general meeting of this company was held on Wednesday last, at the Cannon-street Hotel. Mr. E. A. Pontifex (the chairman of the company) presiding.

The Secretary (Mr. J. C. Leaver) having read the notice calling the meeting,

The Chairman said: Gentlemen, the accounts, which are in your hands, show a fairly satisfactory result of our past year's working. Notwithstanding that, from causes to which I will refer hereafter, our make of copper has been less than in some previous years—we have made a profit of £106,410, against £86,040 in 1888-9. We raised 24,891 tons of ore in 1889-90, against 26,193 tons in the previous year. The Swansea assays for the past year averaged 21½ per cent., against 22¼ per cent. for 1889, showing a reduction of ¾ per cent. in the copper contents of the ore. Inasmuch as there was an increase of 75 tons in the quantity of ore raised from the Trial Mines, this shows a reduction in that obtained from Ookiep of 1,377 tons. The costs of raising continue to be reduced, notwithstanding the diminished production. In 1889, they were 1/9½ per unit, and in 1890 they were 1/7½ per unit. The total costs, inclusive of those of raising, amount to 5/6 per unit in the former year, and 5s. in 1890. This is £17,300 in our total production. The price obtained for our copper is 10s. per unit in the past, as against 9s. 1d. per unit in the previous year. Our liabilities have been reduced from the abnormally high figure of £358,230—at which, owing to the copper collapse, they stood last year—to the somewhat more moderate amount of £233,499. They would have been still further reduced but for an outlay in the new smelting works at the Cape, for the sulphate of copper works at Briton Ferry, and in connection with our newly-acquired mines at Tilt Cove. The first is responsible for an increase of about £11,000, the second for a little over £5,700, and the third for £20,546; a total of £37,246. The indebtedness to the company has also been reduced. It was £242,947 in 1889, and it is now £113,708. The railway has continued to perform excellent service during the past year, and the mountain locomotive has proved a complete success, though we may have to scarf away the hill-sides a little more in one or two places, so as to ease the curves, and thereby diminish the wear and tear of the rails and tyres. A good deal has already been done in improving the line over the mountain so as to fit it for locomotive traction, the whole cost of which has been carried to revenue account. During the past year the railway has carried 37,485 tons down to the coast, and 6,718 tons up. We have received for carrying for the Namaqua Company and for the general public £22,863 as against £16,807 last year. A fair proportion of this is in excess of the actual cost of transport, but our exceptional position of having so largely to rely for traffic upon our own mine, and there being practically no public traffic apart from that arising from our own and from the Namaqua Company renders it necessary that a much larger proportion than usual

of the gross receipts should be looked to for recompense of our capital expenditure. The smelting works which we have been erecting in the colony have made somewhat slow progress, but they are now approaching completion. We expect by this means to supplement the profits made from our Ookiep Mine by being able to treat the considerable quantities of low-grade ores which we are extracting from our East Ookiep Mine and elsewhere. They may also serve as a useful check to the vagaries of our workmen at Briton Ferry, who are still giving a good deal of trouble, or rather they were doing so until within the last few days, when they withdrew from a very unreasonable attitude which they had taken up. Our smelting works in this country have continued to be of essential service to us, by enabling us to deal with our ores to better advantage than if we had to dispose of them to other smelters. But these works have not been so profitable to us this year as they should have been, partly because of the increased cost of labour and fuel, but chiefly because, with their higher wages, the men seem to have lost all desire to do good work, and to obtain the best results from their furnaces. And since profitable smelting depends upon the extraction of the metal being performed as completely and with as little consumption of fuel as possible, carelessness and indifference to these points very soon and very seriously affect the profits. This is one of those causes to which I referred in my opening remarks which have adversely affected our output of metal during the year. The other has been that, in view of the fact that we still do not find any considerable body of ore at or below the 105 fm. level in Ookiep, it becomes desirable to work that mine in a somewhat more conservative fashion. The lateral extensions, however, continue in a measure to compensate for this want of important discoveries in depth, and it is to be hoped that in the ensuing year better prices than were current in the early months of our last campaign will make up for any diminished quantities, and especially that they will be, perhaps, more than compensated for by the production from the company's newly-acquired mines at Tilt Cove. These mines are opening out exceedingly well, and the difficulty as to smelting which the former company experienced would seem to have been overcome by our Briton Ferry manager and metallurgist, Dr. Haege. As to the production which we may expect from these mines, I will ask Mr. Taylor to give you his views. I think that we may look forward to obtaining a good price for our produce during the current financial year. The statistics of the copper market continue exceedingly good, although there is for the moment a little check in the consumptive demand, as might be expected from the recent disturbance in the money market, and from the time of the year. Last month our visible supply decreased 2,785 tons, making the total decrease for the year, up to the end of November, 34,544 tons, and during the present month the visible supply has further diminished by 1,353 tons. Some doubts have been thrown on the accuracy of the monthly returns, but, I believe, entirely without justification. So far as can be ascertained, there is only about 15,000 tons of copper held in what may be called speculative hands over and above those which appear in the published returns, though, doubtless, the consumers hold larger working stocks now than they did when the operations of the French syndicate created so much well-founded alarm. I last year alluded to the greatly increased consumption of copper which was occasioned by the use of sulphate of copper in the cultivation of the vine. It is calculated that as much as 25,000 tons of metallic copper was used last year for this purpose alone, and, although the demand for sulphate of copper has lately slackened, it is now reviving, and those who are in a position to judge estimate that nearly as much sulphate will be required this year at last.

The consumption for electrolytic purposes is also continuously increasing, and is not unlikely in the future to do so in an even greater ratio, as we in England, and especially in London, are much behind other countries in the adoption of electricity for lighting and for other purposes. With tolerably good general trade, therefore, we may continue to look for good prices for copper in the future. At our last meeting you were informed that we had been compelled to take action against the Société des Métaux, and its guarantor, the Comptoir d'Escompte, in respect to their breaches of contract with us. The former company had the excuse of bankruptcy, and of its absolute inability to perform its contract; but the latter repudiated their obligations, because they found it unprofitable to carry them out, and they pleaded that they could not be compelled to do so, because they had gone outside the letter of their statutes. As the judge said who tried the case, they took the profits cheerfully so long as there were any, but directly a loss appeared on the horizon they repudiated the contract on the ground that they had acted *ultra vires* in entering into it. This does not seem a very high-minded course for a great French financial house to take, but it was successful, and we have to pay their costs as well as our own, unless, indeed, they should see the propriety in such circumstances of relinquishing their claim to costs. Notwithstanding this conduct of the Comptoir, we have not, upon the whole, come so bad out of the litigation. Unless we had gone into the fight, we should have had to deliver up the whole of the copper in our possession for which the Société had paid. The position was this: we had paid for all the copper which we had delivered, and we had also been paid for somewhat over 3,000 tons the delivery of which was due, but of which the Société had not taken physical delivery. We had, however, given for these 3,000 tons documents which the holders claim to be equivalent to delivery warrants, but which we maintain were merely certificates of indebtedness, not legally transferable by endorsement. These certificates had been transferred for value by the Société to third parties, who claimed delivery of the copper. We argued that they could only claim through the Société, against whom our equities in respect of their breach of contract arose. Before we could enforce these equities it was necessary that we should obtain a judgment against the Société. But Messrs. Mason and Barry were in advance of us in this respect, and by virtue of their judgment they attached any copper in our hands in respect of which the Société had an interest. Here was a nice little legal complication. We were told by many that we had no equities in the copper, but that even if we had, the possession passed with the so-called warrants. If we were successful in both these contentions, our success would be valueless to us, because of the prior judgment and attachment obtained by Messrs. Mason and Barry. Although apparently in a cleft stick, we did not lose heart, and we explained to Messrs. Mason and Barry that we should only fight the holders of the warrants if we and not they were to reap the bulk of the benefit. Otherwise, of course, we should climb down at once. They met us in a very friendly spirit, and agreed that if we won we should pay them the sum of £10,000. as satisfaction for their judgment, which was for a very large amount. Armed with this conditional compromise, and having won our action with the Société, we approached the holders of the warrants, and compromised the case with them also—upon the basis that we should delivea up two-thirds of the disputed quantity, and retain one-third. This left us with 1,050 tons of copper in hand, the value of which was sufficient, after paying the fearfully heavy law costs, and paying Messrs. Mason and Barry their £10,000., to leave us with about £45,000. as damages for breach of contract. I believe that of all the parties to the contract with the Société we are the only company who not only has been paid for all the copper delivered, but also has got something by way of compensation for breach of contract. In addition to the £45,000. we expect to get some dividend from the estate of the Société, in respect of a proof for £17,000. which has been admitted by its liquidator in Paris. Neither of these amounts appear in the accounts of the past year, but will do so in those of the ensuing one, to which they properly belong. With these remarks, I beg to move that the report and accounts, which have been laid before you, be adopted. (Applause.)

Mr. John Galsworthy seconded the resolution.

Mr. Yetts pointed out that in the last financial statement there was a suspense account of £110,000., which in the previous year amounted to £200,000. It did not appear how the difference was accounted for, and what the suspense amount meant.

The Secretary said the suspense amount was created from profits, because they had valued the ores in the year at the price to be obtained from the Société des Métaux; in fact, it was to cover the failure of the Société. Since then the stock had been sold, and the difference between the price to be obtained and what they got for it had been carried to suspense account, thus reducing that account.

The resolution was then carried unanimously.

Mr. John Taylor said he would like to confirm, in a very few words, what the chairman had said with regard to the Tilt Cove property. That was a property which he and Mr. Leaver had special knowledge of before any one else connected with the Cape Copper Company, and he thought he might, with absolute certainty and safety, assure the shareholders that the development of the great deposit of ore in the east mine had gone on most satisfactorily since it came into their possession. Not only had the body of ore continued to hold down as they had worked upon it equally large, but it had fully maintained, and more than maintained, its average richness, which, of course, was a very great point indeed. A large quantity of ore of 2 or 3 per cent. might be of no value to them whatever, but an enormous amount of ore of more than 4½ per cent. must be as time went on a very valuable property indeed. Beyond that, the report of Dr. Haege, which was appended to that of the directors, must make it evident to the shareholders that the West Mine, of which very little was said when the question of the taking over of the property was suggested, must have been an enormously rich mine. That was entirely independent of the East Mine, and the large deposit which they had spoken of so often, and Dr. Haege told them in very clear language that an enormous mass of stuff was lying at the surface which had been left as worthless. This, he said, contained from 4½ to 6 per cent. of copper, demonstrating very clearly how good a mine it must have been when in full operation. That mine would doubtless require a vigorous exploration, and he thought it would become a very good property as time went on. The chairman had spoken about the consumption of copper for the purposes of electrical transmission of power. He (Mr. Taylor) would like to say one word upon that,

because he believed he had information upon the subject more authoritative and absolutely definite and satisfactory to himself than any in the possession of many people at present. His firm had the management of, he believed, the first English company which had started, and had in full swing the working of mines upon a very considerable scale by electrically transmitted power. The company he referred to was working a mine in California, the water where the turbine was situated being about two miles distant, and they were treating now upwards of 3,000 tons of gold rock a month in the mills. The last letter from their superintendent there said that the electrical machinery was working like a well-regulated clock, and there was an extremely small loss of power in the transmission over that distance. He (Mr. Taylor) left the shareholders to judge how immensely this must spread—this working, not only of mines but of other industries, at considerable distances from the source of power particularly in mountainous countries. (Applause.)

The Chairman proposed the re-election of Mr. T. Russell Kent as a director, and Mr. Sweetland seconded the resolution, which was agreed to *nem. con.*

Mr. Roderick Mackay, the auditor, was re-appointed on the motion of Mr. Clauson.

Mr. Bullock proposed a cordial vote of thanks to the chairman and his colleagues, as well as to the staff in London and the colony, which was seconded and carried unanimously.

The meeting then terminated.

Official Memoranda.

From the Board of Trade Journal.

THE MINERAL RESOURCES OF INDIA.

THE following interesting information respecting the mineral resources of India is extracted from the *Times of India* for the 25th October :—

Though less interesting than iron, in that they do not affect the greatness of the country so much, the baser metals of India are of especial interest from the antiquity of their development, and the fact that to a large proportion of the inhabitants they have, practically, been the only useful metals known. The noble metals, as gold and silver are called, have been used almost entirely for ornament and coinage. Platinum, really a precious metal, more valuable even than gold, is generally found with the latter, though rejected by the native gold washers of the Indus Valley as *safed sona* and valueless. It has never yet been discovered in large quantities in India, and except in the Indus Valley and the Kolar gold-fields, we have no evidence of the discovery of more than traces of the metal. Mercury, though understood in this country, does not seem to have been discovered in large quantities, though the persistent rumour that asserts its plentiful presence in the Andaman Islands can hardly be without some basis. The probable explanation may be in a discovery of cinnabar in the Little Andaman, which has, as yet, never been thoroughly searched, as its rocks of the early tertiary period interspersed with volcanic "faults" closely assimilated to those of the great mercury beds of California. The author of "Hamilton's East Indies" saw in 1694 a native who had bought much mercury from the Little Andaman (of which he was a native, stolen in his youth and partly civilised) to the Nicobars. It has been discovered in Cannanore in spots of pure metal in a bed of laterite, but never seems to have been much developed. Pure mercury is brought from Afghanistan, said to be obtained from Pir Kisree, some 250 miles beyond Kandahar. The trade, however, has never reached any size. Of the baser metals proper, by far the most important and valuable is copper, as it is also, perhaps, the oldest known in Asia. There are mines now unused that appear to be of great antiquity, showing in this as in many other things how greatly the people of India have deteriorated in scientific knowledge. Where formerly the extraction and smelting of copper ores was carried out on a large scale, we now see petty workings that yield before every reverse of nature. The largest copper workings in India are those of the Singhbhum district, extending as they do for over 76 miles from Midnapore to Lohardugga. It is believed that the Jains started mining in this district over two thousand years ago, since which they have never quite ceased work.

In the Goomacunda Valley, in the Karnaul district, there exists a deserted copper mine, so old that the very legend of its workers has been lost to the people living there. In the Hazaribagh district there are also deserted copper mines and large mounds of copper slag, showing that the ore was smelted on the spot. Ore is found here, which would probably repay any attempt at systematic working. The chief secrets of success in Indian mining seems to be: 1st. working on a scientific basis so as to waste neither metal nor labour; and 2nd, utilising native labour wherever possible, and obtaining European foremen who can teach their men the practical use of their tools.

The Khetri mines as they are called, including those of Kulhari and Singhana, are still worked, and of great antiquity. They resemble nothing so much as a rabbit-warren, the galleries, such as they are, winding about after the metal and being little bigger than absolutely required to admit the bodies of the miners. Large quantities of blue vitriol and copperas are extracted from the refuse of the mines, and these "refuse products" are at least as valuable as the actual ore itself as at present extracted; but this is becoming a not uncommon feature of modern manufacturing industries. Flooding is the great danger of the Kulhari galleries, as the only means of clearing them from water consists of a string of men with *ghur as*. The Singhana mine must have paid well in former days, for the miners paid 14,000 rupees a year to the Khetri hajah as the rent of the mines, in addition to one-sixth of the copper mined. It is thought that copper mining in the Hazara district would be profitable; but the question of carriage would be a serious one, though the ore is extremely rich, being in this respect far superior to that found in Kumaon. The Nepalese do a good deal of copper mining in a small way, their ore yielding about 4½ per cent. of copper. The Hazara ores are said to have yielded from 60 to 90 per cent. of copper from the picked ore, but we feel utterly disinclined to accept these figures. They probably were obtained, if obtained at all, from small and excessively rich selected pieces, and are by no means a fair sample of the whole. Possibly by "copper" is meant "regulus," which *in itself* only yields 50 per cent. of copper. Even the smallest pieces of ore could not yield 90 per cent. of pure metal. Next to copper, its common alloys, zinc and tin are the most interesting of the baser metals. Zinc is only found to any extent in Oodeypore, where the Jawar mines were formerly worked on a large scale, and yielded a yearly revenue of nearly 2¼ lakhs of rupees. At present no extensive zinc workings exist in India, though possibly the indications of the metal at both Sirmur and Tavoy might yield profitable results to scientific development. Tin, on the contrary, is found on a large scale in several places, though the fact that the natives of India have used brass universally for centuries seems to point to the presence of zinc in some form or another possibly imported. Tin occurs chiefly as a dioxide, the tin stone containing as much as from 75 to 80 per cent. of metallic tin. In 1867 the native iron smelters of Raniganj smelted some of the tin stone, supposing it to be iron ore, and when they saw white metal, mistook it to be silver. Burmah is the greatest Indian source of tin. It is worked by the Karens in the hills near the salwin, and sold by them in Tounghu. In the Tenasserim division tin stone is very plentiful, every stream bed near Maleewoon in Mergui yielding the metal when washed. Dr. Oldham states that the main source of all the Tenasserim tin is the granite range separating that province from Siam, where "it exists as an essential ingredient of the mass of rock, occurring disseminated through the granite in small crystals and being similarly arranged to the quartz and felspar . . . The degradation of this granite by weathering through an enormous period of time has supplied the sand which is now so abundantly impregnated with stream tin."

At Mergui it used to be worked in the very gardens of the town, and in the Thawbawleck River there have been extensive stream washings for years; the fine sand being sorted out with a cane shovel that acts like a large sieve, and finally washed in wooden dishes, in which the tin sinks by its own weight on the water being revolved. The only European attempt to work Burmese tin on a considerable scale was made between 1873 and 1877, when Messrs. Steel and Sons leased the township of Maleewoon, where they not only washed the stream tin but opened out veins of ore in the hills. During the cold weather of 1874-75 some seven tons of metal and 14 tons of cleaned picked ore were exported. The works were, however, closed in 1877. It is worthy of note, however, that since the European workers failed, the Chinese have found the mines remunerative, and are still at work there, though they pay a ground rent and a royalty of 5 per cent.

From a manufacturing point of view, tin naturally suggests lead, and no mining industry, except iron, shows such a falling off as that of the working of lead mines. Galena, the sulphide of lead, is common in many parts of India, but Cuddapah and Karnaul are probably richest in the ore. In Cuddapah, at the village of Judgumrazpilly, close to the Nallamallay Hills, the old lead workings are conspicuous.

A sample of ore from these regions was analysed in 1879, and yielded 78 per cent. of lead and 22 oz. 7 dwt. of silver to the ton of lead. Both these and the Karnaul mines would probably repay scientific exploitation handsomely. Three analyses of ore from the latter yielded, respectively, 374 oz., 175 oz., and 165 oz., of silver to the ton, which would render them well worth working. In Bengal galena has been found in the Sonthal Pergunnahs and also in Bhagalpore. An analysis of ore found in the latter district showed 78 per cent. of lead and 103 oz of silver to the ton. Hazaribagh, so rich in metals, yields also galena, and in 1880 a company was formed in Bombay to work this district; but it came to nothing. Ajmere, Sirmur, and Tenasserim would also yield profitable results. Truly, the mineral wealth of India has been sadly neglected.

PERMANENT CHEMICAL EXHIBITION.

VISITORS are admitted without charge; they are requested to leave their cards, and will confer a favour by making any suggestions that may occur to them in the direction of promoting the usefulness of the Institution.

Joseph Aird, Greatbridge.—Iron tubes and coils of all kinds.

Ashmore, Benson, Pease and Co., Stockton-on-Tees.—Sulphate of Ammonia Stills, Green's Patent Scrubber, Gasometers, and Gas Plant generally.

Blackman Ventilating Co., Ld., London.—Fans, Air Propellers, Ventilating Machinery.

Geo. G. Blackwell, Liverpool. — Manganese Ores, Bauxite, French Chalk. Importers of minerals of every description.

Brunner, Mond and Co., Ld., Northwich.—Bicarbonate of Soda, Soda Ash, Soda Crystals, Muriate of Ammonia, Sulphate of Ammonia, Sesqui-Carbonate of Ammonia.

Buckley Brick and Tile Co., Ld., Buckley.—Slabs, Blocks, Tiles, Bricks, &c., of Fireclay and "Metalline," material.

Chadderton Iron Works Co., Ld., Chadderton.—Steam Driers and Steam Traps (McDougall's Patent).

W. F. Clay, Edinburgh.—Scientific Literature—English, French, German, American. Works on Chemistry a speciality.

Clayton Aniline Co., Ld., Clayton.—Aniline Colours, Aniline Salt, Benzole, Toluole, Xylole, and Nitro-compounds of all kinds.

J. Cortin, Newcastle-on-Tyne. — Regulus and Brass Taps and Valves, "Non-rotative Acid Valves," Lead Burning Apparatus.

R. Daglish and Co., St. Helens.—Photographs of Chemical Plant —Blowing Engines, Filter Presses, Sludge Pumps, &c.

Davis Bros., Manchester. —Samples of Products from various Chemical processes—Coal Distilling, Evaporation of Paper-lyes, Treatment of waste liquor from mills, &c.

R. & J. Dempster, Manchester.—Photographs of Gas Plants, Holders, Condensers, Purifiers, &c.

Doulton and Co., Lambeth.—Specimens of Chemical Stoneware, Stills, Condensers, Receivers, Boiling-pots, Store jars, &c.

E. Fahrig, 24, Listria Park, Stamford Hill, London.—Ozonised products. Ozone-Bleached Esparto-pulp, Ozonised Oil, Ozone-, Ammoniated Lime, &c.

Galloways, Limited, Manchester. — Photographs illustrating Boiler factory, and an installation of 1,500-h.p.

John A. Gilbert and Co., Ltd., London.—Automatic Stills, and Patent Mixing Machinery for Dry Paints, Powders, &c.

Grimshaw Bros., Limited, Clayton.—Zinc Compounds. Sizing Materials, India-rubber Chemicals.

Jewsbury and Brown, Manchester.—Samples of Aerated Waters.

Joseph Kershaw and Co., Hollinwood.—Soaps, Greases, and Varnishes of various kinds to suit all requirements.

C. R. Lindsey and Co., Clayton.—Lead Salts, (Acetate, Nitrate, etc.) Sulphate of Copper, etc.

Chas. Lowe and Co., Reddish.—Mural Tablet. Makers of Carbolic Crystals, Cresylic and Picric Acids, Sheep Dip, Disinfectants, &c.

Manchester Aniline Co., Manchester. — Aniline Colours. Samples of Dyed Goods and Miscellaneous Chemicals, both organic and inorganic.

Marple Chemical Co.—Improved Iron Carboy Hampers.

Meldrum Bros., Manchester. — Steam Ejectors, Exhausters, Silent Boiling Jets, Air Compressors, and Acid Lifters.

E. D. Milnes and Brother, Bury.—Dyewoods and Dyewood Extracts. Also samples of dyed fabrics.

Musgrave and Co., Belfast.—Slow Combustion Stoves. Makers of all kinds of heating appliances.

Newcastle Chemical Works Company, Limited, Newcastle-on-Tyne.—Caustic Soda (ground and solid), Soda Ash, Recovered Sulphur, etc.

Robinson, Cooks, and Company, St. Helens.—Drawings, illustrating their Gas Compressors and Vacuum Pumps, fitted with Pilkington and Forrest's patent Valves.

J. Royle, Manchester.—Steam Reducing Valves.

A. Smith, Clayton.—India-rubber Chemicals, Rubber Substitute, Bisulphide of Carbon, Solvent Naphtha, Liquid Ammonia, and Disinfecting Fluids.

Northington Pumping Engine Company, London.— Pumping Machinery. Speciality, their "Duplex" Pump.

Joseph Wright and Company, Tipton.—Berryman Feed-water Heater. Makers also of Multiple Effect Stills and Water, Softening Apparatus.

DYEING WOOL WITH ALIZARINE COLOURS.

BEFORE the introduction of the now well-known alizarine colours, the wood dyer had to use madder or garancine for producing fast reds. There were many difficulties in their use which cropped up from time to time; colours would come up uneven; a perfectly even colour was very hard to get, and was always a matter of uncertainty; matching colours was almost impossible by the old madder process, the dyer never knowing exactly what shade he would get; another fault was the extreme slowness of the process, which necessitated long boilings, and these by no means improved the wool; then the insoluble powder that was used got into the wool, and the longer the boiling, obviously the more it was fixed, and its removal could only be effected by repeated washings. Frequently, to avoid all these troubles, wool dyers employed the red woods, or archil, which are much easier to use than madder, but at the same time the shades they give are much more fugitive, and the results on that account not as satisfactory.

The same with indigo; a vat blue was satisfactory so far as regarded fastness, but was rather troublesome to use in wool dyeing; the extract is much easier to use and gives fine shades, but these are very fugitive. When the shade wanted was such as enabled dyers to adopt the process, moderately fast shades were got by giving a vat blue bottom, mordanting with alum and tartar in the usual way, then dyeing up with archil, fustic extract, and indigo extract. The shades so got were fast to milling but the red was fugitive and soon disappeared on the goods being exposed to light; the yellow did not fade quite as much, while the blue remained, the result being that the cloth thus dyed faded to a greenish blue or grey.

The introduction of alizarine got rid of all these difficulties in the way of producing colours fast in every sense of the term; it at once displaced madder and to a great extent archil, cochineal, and the red woods. Being a definite compound, matching became easy, and dyers can depend upon always obtaining the same shade. A few trials will soon shew dyers what quantities of materials are required to produce a given shade, and as a rule regular results can be depended upon. If the shade should happen to come up too light, it may be due to the process not having been carried on properly. the best method of curing this defect is to let the dye bath cool down, run off some of the liquor, add more cold water and alizarine, and dye up again. If the shade come up too dark, the addition of a little sulphuric acid will bring it down, and by using whiting the action the acid can be regulated at will.

Alizarine blue is a colouring matter that was not available to the older dyers. It is not as easy to use as the other alizarine dyestuffs. The dyebath must be worked for some time at about 90° F. to ensure proper penetration of the dyestuffs into the tissue. Then the temperature must be slowly raised, and when it gets to 150° F., it should be kept at that heat and the goods well worked for at least half-an-hour, when the heat may be further increased. Between 150° F. and 180° F. the blue begins to be fixed on the fibre, and to ensure level dyeing it is important to work slowly and to keep the goods well moved. A little acetic acid in the proportion of 1 part to 1,000 of dye liquor facilitates the operation.

Calcareous and magnesian waters form a blue lake with the dyestuff, which is deposited loosely on the goods, and which, therefore, washes off and detracts from the brightness and solidity of the dyed stuffs. In such cases sufficient acetic acid should be added to neutralise the lime and magnesia in the waters.

The alizarine colours are exceedingly useful in dyeing what are known as the mode colours; the number of combinations, and therefore the variety of shades that can be obtained are infinite, and nothing but hints can be given in the limits of this article. They may also be combined with extracts of the dyewoods, but of these only fustic can be said to give perfectly satisfactory results when used in combination with alizarine colours.

Bronze is got with 2¾lb. alizarine blue, 1lb. alizarine red, 10lb. fustic extract; chocolate with 10 to 20lb. alizarine red; clarets with 5 to 10lb. alizarine red; prune, 3lb. alizarine blue, and 2½lb. alizarine red; chestnut, 1½lb. alizarine red, 1½lb. alizarine blue, and 10lb. fustic extract. For Havannah, use about half the quantity of materials given for chestnut; for dark green 6 to 10lb.; and for cæruline blue, 6lb. alizarine blue, and 2½lb. cæruline. All the above are for 100lb. wool mordanted with chrome.

Salmon can be dyed with ½ to 1lb. alizarine red on alum, tartar, and tin mordant, using acetate of lime in the dye bath. A bright red can be dyed in a single bath with 12lb. alizarine red, 6lb. tin crystals, 4lb. oxalic acid, and 5lb. acetate of lime, but it is always best with the alizarines to use mordant and dyestuffs in separate baths. Grey by 1lb. alizarine red, 12ozs. alizarine blue, and 3lb. fustic extract on alum and tartar mordant. A pearl grey is got by using alizarine red on a uranium mordant (1 part to 200 of wool), fine full shades being easily obtained. —*Textile Mercury.*

RELATIVE VALUE OF LUBRICANTS BY MECHANICAL TESTS.*

FROM several instances we may learn the following: First, that any such idea as that oils have certain powers of resisting wearing out, which differs largely among the various oils currently used, is an absurdity, since the rates at which oil spent or consumed vary enormously with different classes of practice, and the most economical conditions of practice where oil is fed through needle-feed cups, as on locomotive crank-pins, and light mill shafting, cannot be any measure of durability, for the oil escapes from the journals by capillary action so fast, that it has no time to be depreciated in its wearing qualities. It is capable of filtration and repeated use after escaping from any practical journal where used with the minimum rate of feeding possible. In a special article devoted to the subject of durability, I have presented facts which, I think, prove conclusively that the durability of lubricants depends upon the rate at which they will feed on to bearings and escape from the latter, and that the greater the viscosity which an oil may possess, without being incapable of feeding to a journal at a uniform rate, the greater will be its durability, so far as a quality exists.

Second, that uniformity in the rate of feeding oil or any lubricants exerts the most important influence of any element entering into the determination of its ability as a satisfactory lubricant. Now, of what value is our mechanical test on our oil-testing machine as a factor among these problems? Answer: Used with ultra smooth bearings and a surplus feed, we should have once more only the differences due to viscosity before us. And these differences have played no part in the heavy machinery instances cited, because the extra friction due to differences of viscosity were of no consequence compared to what was effected by differences in the uniformity or rate of feeding the oil. If our oil-testing machine should be tried with the same form of oil-cup used on the locomotive, and with the grease fed by churning through feed holes, and with the surplus drip feed adopted in the electric light stations, and on dynamos generally, information of interest and in conformity with the actual experiences would be obtained, which would be valuable in tending to educate practical men to take more intelligent views in these matters. So far as I am aware, however, little or no such work has ever been done with mechanical oil-testing machines, because the operators make it a cardinal principle at the outset to eliminate all irregularities of behaviour due to irregularities, such as practice bases all its distinctions upon. Also, the oil testing machine must study the action of the lubricants upon bearings as rough and as variable in their condition, as are the practical bearings which have no chance to become artificially smooth, from the fact that few of them have lateral movement, and because they are frequently accidentally abraded so as to disturb their surfaces out of a condition of minimum smoothness. I am aware that there have been occasional brief investigations with oil testing machines in railroad laboratories, which have attempted to copy the rates and methods of feeding abounding in practice, but I have yet to hear of any investigation made without artificially smooth surfaces, or surfaces incapable of causing excessive heating with any form of current lubricant.

Consider now the case of railway car lubrication. The circumstances are more interesting, I think, than those of any other class of lubrication.

The three elements which determine the value of a lubricant for railroad car service, so far as it can be definitely discussed, are the cost due to consumption of lubricants, the cost spent for coal to overcome the frictional resistance caused by use of the lubricant, and the cost due to the metallic wear on the journal and the brasses. We have seen how in cotton mills the cost of the power is alone to be considered, that in rolling mills and marine engines the cost of the quantity of lubricant used is the only important factor, but in railroads not only do both these elements enter the problem as tangible factors, but the cost of the wearing away of the metallic parts enters in addition, and furthermore the latter is the greatest element of cost in the case.

Assuming ordinary prevailing prices for oil, if the consumption of the latter costs one unit—the coal to overcome the friction of the journal only is (not including wheel flange resistance, or rolling friction, or wind resistance) about three units; and the cost of metal worn away is about six units.

In no other service is there so rapid a rate of metallic wear. Such wear comes about first from the heavy pressure and rapid speed of running to which the bearings are subjected; second, from the fact that the lubricant is always mixed with more or less grinding ingredient, and third, because there is a constant movement of the brass length-wise of the journal.

*From an address by Professor James E. Denton at the Indianapolis meeting of the American Association for the Advancement of Science.

The latter feature is peculiar to car service.

The railroad brass which has not yet over-heated itself has given to it a surface absolutely devoid of all circular grooves or lines. General machinery bearings always present such circular lines, and their friction is always greater on this account than is that of the well-worn journal of a railroad car. I believe it is a well established fact that a bearing not having constant end-play rarely affords a friction less than 5 per cent. with ordinary rates of feeding oil. But in railroad practice bearings which are planished by the constant end-play rarely afford a friction of a fraction of one per cent. to one and one-half per cent. with any of the methods of feeding, from a bath to pads or saturated waste, and including conditions of the oil varying from freshness to that acquired by several months' use in a car box. So far as is now known, the frictional resistance of the journal is about 10 per cent. of the whole power exerted, so that a variation of friction on the part of the lubricant of fifty per cent. effects about five per cent. of the coal consumption of the engine. Such increase of friction represents about the greatest difference of viscosity found among current lubricants, as say between lard oil and a petroleum cylinder stock; and it may readily affect the coal consumption to a sensible degree. On the other hand, if, as is probable, the more viscous oil maintains a thicker film between the rubbing surfaces, the latter may touch less frequently and the metallic wear be less to such an extent that the total expense of lubrication may be less. But the more viscous lubricant may not have the ability to feed itself to the journal through the medium of the waste or feeding pad in cold weather. In this case journals run dry and overheat.

It is a nice problem; and one yet unsolved, to determine just how viscous a lubricant may be the best under the circumstances. The average practice is to use an oil of about the fluidity of lard or neat's foot for the passenger or more important service, and a much more fluid purely petroleum product for the freight service. The oils stipulated almost universally for the passenger coach and engine service contain from thirty to fifty per cent. of animal or vegetable ingredient combined with paraffine, or what is known as a petroleum black oil of about 350 degrees flash point. The consistency of viscosity of such mixtures differs very little from that of lard or sperm oil. The specifications forbid the use of the pure petroleum oils used on freight service for the most expensive or responsible passenger traffic.

There is clearly a belief throughout the whole of railroad practice that the oils used for freight service, which in general are subject to less rubbing speed, are inferior as lubricants to the mixture of animal and petroleum assigned to passenger service. Yet, if the two classes of oil are tested on the oil testing machine, the sole result which the latter affords, by any present method of using it, shows that the petroleum freight oil has but about fifty per cent. of the frictional resistance of the passenger mixture. The testing machine has its journals reduced to the artificial state of smoothness to which we have constantly referred, and the coefficient or friction shown under these conditions at the average pressure of speed, of running which obtained in car service, is from one-quarter to one-half of one per cent.

There is no doubt that the same co-efficients obtained in actual service when bearings are well supplied with oil. By the verdict of the testing machine, therefore, the pure petroleum oil is the superior lubricant.

Yet this oil is never intrusted with the lubrication of the traffic which is considered to require the best lubricant. No specifications issued by railroads regarding lubricating oils have, I believe, yet ventured to stipulate any conditions of practical mechanical test as a measure of value of lubricants. This fact shows clearly that no basis of distinction for their lubricating oils has been found by using the testing machine under these artificial conditions, and no other conditions have yet been cultivated. When, therefore, the expert in charge of a railroad laboratory has placed before him a number of samples of lubricating oil, all apparently of the same fluidity, and practically of similar composition, and is required to discriminate regarding their relative value for car lubrication by the use of a mechanical testing machine which simply measures the coefficient of friction, and copies none of the conditions of service except the rubbing speed and the pressure per square inch, he must either acknowledge that the machine affords no means of making the distinctions required, or else he deceives himself by setting up distinctions which have no practical significance. One claim made by experts in railroad lubricants is that the thinnest or more fluid lubricant obtainable is best, on the ground that the power to insinuate itself between the rubbing surfaces is the controlling element in the success of a lubricant. On the other hand, the opinion is put forth that the excessive pressure often brought upon car journals makes it a fact that greases are the only lubricants capable of withstanding this pressure, and, as is well known, greases are extensively used as railroad lubricants in European practice.

A simple experiment suffices to show that there is no practical difference of ability among lubricants of widely differing states of fluidity, to insinuate themselves between two fairly smooth surfaces which fit so closely that the film of oil cannot be less than a ten-

thousandth part of an inch. Thus if we smear the plug and ring of a half-inch standard guage with either lard oil, paraffine oil or the thick viscous oil which is used for cylinder lubrication, and which will scarcely flow at 70 deg. Fahr., we find that the readiness with which the plug will enter the ring does not differ with these oils, and the plug is, according to Pratt & Whitney, not more than one-thirty-thousandth of an inch smaller than the ring, with any of these oils we may slide the two pieces over each other.

The force to move them will be sensibly greater with the more viscous oil. Also, if we cease to move the pieces, the interval of time in which they will become locked upon each other will vary from five seconds with the thinnest oil to as many minutes with the thicker oil—a fact which simply means that the time for one oil to be squeezed through the annular orifice between the ring and the plug varies with the viscosity. Therefore, the relative ability of lubricants to insinuate themselves between the bearings in car journals affords no basis for the relative valuation of lubricants.

Regarding the pressure to which oil is subjected in railroad car service, it is probably more severe than in any other class of practice. Car brasses, when used bare, are so imperfectly fitted to the journal, that, during the early stages of their use, the area of bearing may be but about one square inch. In this case the pressure per square inch is upwards of 6,000 pounds. But at the slowest speeds of freight service the wear of a brass is so rapid that, within about thirty minutes, the area is either increased to about three inches, and is thereby able to reach the oil so that the latter can successfully prevent overheating of the journal, or else overheating takes place with any oil, and measures of relief must be taken which eliminate the question if differences of lubricating power among the different lubricants available. A brass which has been run about fifty miles under 5,000 pounds load may have extended the area of bearing surface to about three square inches. The pressure is then about 1,700 pounds per square inch. It may be assumed that this is an average minimum area for car service where no violent and unmanageable overheating has occurred during the use of a brass for a short time. Now this area will very slowly increase with any lubricant, and experiments can therefore easily be tried to determine whether the pressure which is brought upon a lubricant by such an area in car service excludes from use oils in preference to greases. The apparatus in which I have made such experiments consists of a railroad axle coupled at one end to a 25 horse steam engine, and supported at the other end upon 33 inch friction wheels. A 12 inch wheel forced on the axle, as is the car wheel, serves as the rolling support upon the friction wheels.

A regular car box can be used packed with waste or with a siphon pad, or a special brass, having a perfect cylindrical outer surface to receive the load, so as to make the line of the latter pass as accurately as possible through the centre of the journal. The load is applied by a steelyard and may be any amount up to 20,000 pounds.

The friction is weighed by counterpoises on a lever fixed to the brass or bearing. The resistence of the oil pad, or bath, is eliminated by supporting the pad or oil bath on a bracket fixed to the main foundations of the machine. With a load of 10,000 pounds, a variation of one pound in the amount of the friction is easily distinguished at a speed equivalant to fifteen miles per hour of ordinary railroad service, but an eccentricity of the load of one-five-thousandth of an inch, will destroy the absolute value of this indication. Provision is therefore made to run in opposite directions, and in determining the co-efficient of friction, this method is always used to eliminate the influence of the possible eccentricity of the line of the load which divides itself into two parts by links depending from each side of the brass to a cross head below the journal, where connections with the loading steelyard are made. Automatic means are provided of maintaining a movement of the brass lengthwise of the journal. A fan is arranged to throw a 14 inch stream of air against the box, in imitation of the cooling effect of the atmosphere to which a railroad is subjected by the translation of the car. The essential features of the apparatus are similar to that used by Mr. B. Tower in his experiments for the English Institution for Mechanical Engineers, and a machine, which I understand has been used for several years on the Brighton Railway, England. Similar machines have been more recently erected at the Brooklyn, U. S., Navy Yard, at the laboratories of the Eastern Railway of France, and elsewhere.

The only features which can be claimed as original are, first, the rolling support at the testing end of the axle, which eliminates all heat at this support from that due to the test bearing, and it permits the temperature of the latter to be a measure of its friction; second, the arrangement for unlimited driving effect by direct coupling of an engine; third, the provision of the cooling influence of the air jet. All of the conditions, are evidently essential to the study of the action of lubricants under such imperfect conditions of bearing surfaces as give rise to excessive friction and overheating. The machine is one of several pieces of special apparatus built for the Lubricating Committee of the Standard Oil Co. The policy of this body is to seek a knowledge of their lubricating products by every method of test which can be regarded as at all capable of leading to definite measures of lubricating value, having any tangible mechanical significance, or practically valuable in any reasonable degree. I am indebted to the courtesy of these gentlemen for the privilege of using their apparatus and making public the results as a purely scientific investigation. From extensive experiments with this apparatus, supplemented with minor devices it results that any lubricant, even those of such extreme fluidity as we have described for spindle lubrication, that is, the lightest paraffins, run for hours by feeding through a pad and wicks, afford the minimum amount of friction at axle loads as great as 10,000 pounds, with an area of only two square inches of bearing, so long as no accidental abrasion or cutting of the rubbing surface occurs. We may, therefore, conclude that so far as mere pressure is concerned between smooth surfaces, there is no basis for discrimination of value among current lubricants for car service, assuming them all capable of being applied in fair quantity to the rubbing surfaces.

A NEW MODIFICATION OF THE OPEN-HEARTH STEEL PROCESS.

By F. Kupelwieser.

In 1888 the author published some calculations showing that in the open-hearth process the use of molten iron from the blast furnace would be attended with considerable saving of fuel, especially when the amount of scrap in the charge is much diminished as in the pig and ore process. The heat of fusion of white pig-iron being 260 calories, and the make of steel where ore alone is used, or with a very small amount of scrap, being about equal to that of the pig-iron, the heat brought into the bath by the fluid metal would be at least 260,000 calories per ton. If this has to be furnished by the combustion of fuel of a calorific value of 7,000, as the Siemens furnace only utilises about 25 per cent. of the heat developed, the amount required will be at least 3 cwt., and proportionally more with fuel of lower heating power. Since the above date this method has been adopted and regularly worked at Witkowitz in three furnaces, where, owing to local difficulties in carrying the iron from the blast furnaces, an empty Bessemer converter, previously heated, was used as an intermediate reservoir. Subsequently the process has been modified by blowing the blast-furnace metal in the converter for two minutes, when the bulk of the silicon and manganese are removed, rendering it more suitable for the basic-lined furnace. The chemical changes are shown in the following analysis:—

	Metal from Blast Furnace.	Metal blown two minutes.
Silicon	0·95	0·26
Manganese	1·77	0·75
Carbon	3·39	3·03

The amount of heat developed in the blowing is theoretically as follows:—

Per ton of 1,000 kilogroms.			Calories.
From 6·9 kilogram	silicon		42,860
,, 10·2 ,,	manganese		15,500
,, 10 ,,	iron		8,750
			67,110

About one-half of this is, however, lost by radiation, so that the amount added to the metal does not exceed 10 per cent. of that brought from the blast furnace: and as this is subject to further diminution by the losses experienced on the double transfer to and from the converter, the loss and gain of heat probably about balance each other; at any rate, the heat added has no particular influence on the working of the open-hearth furnace. The charges at present consist of 90 per cent. cast-iron, 10 per cent. scrap, together with the necessary amount of ore for tempering, and some lime for dephosphorising. The work is done very rapidly; the three furnaces take from fifteen to eighteen charges, or an average of seventeen in twenty-four hours, and the fuel used varies from 10 to 12 per cent. of the weight of the ingots produced—a result which the author considers as unattained by any previous method of working.—*Oesterreichische Zeitschrift für Berg und Hüttenwesen.*

THE ANALYSIS OF SOAP.

By J. F. Schnaible.

OUR knowledge of the composition of soaps and of successful methods of examining the same does not seem commensurate with the importance of the subject. The nature of soap makes its adulteration possible to an extent which greatly decreases its value, or even in such ways that it becomes positively injurious. Again, a very inferior article may be made without such intention by a careless or ignorant manufacturer, but these variations of composition are not generally apparent to the ordinary consumer.

Theoretically, a soap should contain only the combining equivalents of alkalies and fatty acids associated with a small percentage of water. In soap which has not been carefully made, however, there may exist more or less unsaponified fat or free alkali, as the case may be. Besides these variations the commercial soap often contains varying amounts of rosin, alkaline carbonates and silicates, borax, Glauber's salt, pearl ash, starch, silex, talc, sand, etc , complicating the analysis to a corresponding degree In toilet soap we may find glycerine, alcohol, sugar, colouring matter, etc., while medicated soap will often contain phenol sulphur, potassium iodide, and other medical substances.

Of the many analytical methods proposed few are quite satisfactory. After a careful comparison I have found the following to give very acceptable results:

Water.—For the determination of water the method of Loewe (Fresenius Zeitschr., xix., p. 112) was employed with good results. From 80 to 100 grms. of the soap (which has been reduced to very fine shavings, and represents an. average sample) is weighed out between watch glasses and heated in the air bath, at first from 60° to 70° C., to avoid melting, then at 100° to 105° C , constant weight.

In selecting the sample in this, as well as in all subsequent determinations, it is essential that an average specimen be obtained, since the content of water in the different parts of the bar varies considerably.

This is best effected by cutting away about one-third from the end, and evenly scraping the cut surface of the remainder until a sufficient amount is obtained for the analysis.

If the determination of free alkali is of considerable importance, the soap should be dried in an atmosphere free from CO_2. The loss at 105° C. represents the water together with other volatile constituents, such as alcohol and essential oils, which may be present.

Unsaponified Matter.—For the determination of unsaponified matter (Allen's Com. Org. Analysis, vol, ii.), the soap which has been dried in the manner indicated, is extracted in a Soxhlet extraction apparatus with petroleum ether, which for this purpose should boil below 80° C. and should leave no residue on evaporation.

After the extraction is complete, the petroleum ether is distilled off, the residue dried at 100° C. and weighed.

In a boiled, well-made laundry soap, there should be no unsaponified matter unless the same had been subsequently added. In addition to unsaponified fats, foreign matters are sometimes found in the petroleum ether extract, such as soft paraffine (so-called "Mineral Soap Stock"), waxes, hydrocarbon oils, phenol, etc. If waxes are found to be present the dried soap should be extracted with boiling toluene, which dissolves the same better than petroleum ether.

Total Alkali; Fatty Acids.—The dried soap thus freed from unsaponfied matter is next dissolved in hot water, preparatory to determining the total alkali and fatty acids.

A pure soap dissolves completely in hot water, and no ordinary product should leave more than a slight residue.

If the article examined is "scouring soap," the insoluble residue will be found to contain large quantities of fine sand, and sometimes talc. The residue, if appreciable, should be washed by decantation and eventually brought upon a filter with hot water, dried at 100° C., and weighed, after which, if desired, it can be subjected to further examination.

To the aqueous solution is added an excess of $\frac{N}{2}H_2SO_4$, setting free the fatty acids which rise to the surface. The beaker or vessel in which the precipitation was effected is next cooled with ice water. When the fatty acids (Bulletin No. 13, St. 4 p. 456 U. S. Dept. Agr. Chem. Div.) have solidified it is best to decant the liquid, remelt with hot water two or three times to remove any enc osed mineral acid, again cool, filter and wash with cold water until the washings are no longer acid, as shown by litmus.

The filtrate from the insoluble fatty acids contains the total alkali now present as sulphate, the excess of sulphuric acid and any glycerine which may have been present in the soap, if saponification was effected in the cold. The acid liquid may further contain a small amount of soluble fatty acids. It is first titrated with $\frac{N}{2}$KOH, using methyl orange as indicator. (Allen's Com. Org. Analysis, vol. ii., p. 260.) From the original amount of H_2SO_4 added and the number of cc. $\frac{N}{2}$KOH required to neutralise the excess of the same, can be determined the total alkali of the sample. It is calculated as Na_2O.

After the liquid has been rendered neutral to methyl orange (which indicates the mineral acid), phenol-phthalein is added and more KOH is run in. The number of cc. of KOH required for neutralising to phenol-phthalein corresponds to soluble fatty acids, and is calculated to caprylic anhydride.

$$\left.\begin{matrix}C_7H_{15}CO\\C_7H_{15}CO\end{matrix}\right\}O$$

in the absence of more definite knowledge as to their nature.

The solution is now concentrated and tested for glycerine, which may be determined by evaporating to dryness and extracting with ether-alcohol mixture (Chem. Zeit. 8, 1667.), oxidising to oxalic acid by means of permanganate (Chem. Zeit. 9. 975.) (not always applicable.) (Allen's Com. Org. Analysis, vol. ii., p. 290.) In soaps containing silicates of the alkalies (a not unusual constituent), the gelatinous silicic acid which separates on the addition of H_2SO_4, remains with the fatty acids on filtration. To separate the fatty acids from this, as well as all other impurities which may be present, I have found the following method effective:—

The funnel containing the filter with the fatty acids is placed in a small beaker and heated in an air bath (Allen's method). As the filter drys, the fatty acids pass through it and collect in the beaker below, while all the impurities (silicic acid, traces of silica, talc, etc.) remain behind on the filter. Of course it is necessary to wash the filter, which remains saturated with the fatty acids, with hot re-distilled alcohol or petroleum ether, or else exhaust in an extraction apparatus. The alcohol or petroleum ether is distilled off, and the residue treated in the same way as the main quantity of fatty acids.

In determining the fatty acids in a soap, it is frequently convenient to extract with ether in a separating funnel. (*Chem. News*, 43, 218).

To do this the soap solution is placed in the funnel and shaken with H_2SO_4 and ether. The separated acids are at once dissolved in the ether. The aqueous solution may be drawn off below, the ethereal solution washed with water, the ether evaporated, and the residue dried at 100° C. and weighed.

Some analysts recommend (*Chem. News*, 48, 67) melting the fatty acids (if soft) with a weighed amount of paraffin or stearic acid, as by this means a firm coherent cake is obtained, which can be easily handled. The cake is washed, dried and weighed, and the weight of paraffin deducted.

This method, however, is not applicable when it is desired to make a further examination of the fatty acids, to determine their origin; in this case it is better to extract with ether, as given. Since the fatty acids exist in the soap as anhydrides, and are weighed as hydrates, it is necessary to multiply the weight found by the factor, ·9 which gives the weight of fatty anhydrides.

(To be continued.)

PRINTING FAST COLOURS ON COTTON YARN.

1. WITH BASIC COLOURING MATTERS.

THE yarn is impregnated with a 6 per cent. solution of tartar emetic or antimony salt and dried.

Green.—The printing colour is made with

88 grms. solid green,
280 ,, acetic acid,
6 litres of water,
400 grms. farina,
400 ,, dextrine,
800 ,, gall extract (decoloured).

Yellow.—Make the colour as for green, but use auramine.

Violet.—Make the colour as before, using methyl violet.

Red.—Make the colour as before, using a mixture of safranine and auramine.

Blue.—Make the colour as before, using a methylene blue. The printed goods are steamed for half an hour at 1½ atmosphere pressure.

2. FOR DIRECT COTTON COLOURS.

The yarn is previously steeped in a 12 per cent. solution of crystal carbonate and dried.

Orange.—Prepare the printing colour with

80 grms. toluylene orange,
6 litres water,
400 grms. farina,
400 ,, dextrine.

Red.—Prepare the colour as above, but use benzopurpurine.

Brown.—As before, but use benzo brown. Print and steam for half-hour at 1½ atmosphere pressure.

These printed yarns are fast to washing. Dyestuffs similar to those named may be printed on to the yarns by the same means.—*Farb. Must Zeit.*

Correspondence.

***We do not hold ourselves responsible for the opinions expressed by our correspondents.*

THE ADULTERATION OF COAL.

(To the Editor of the Chemical Trade Journal.)

Dear Sir,—If your space will allow, I should like to make a few remarks in connection with the article on the adulteration of coal, in your paper a fortnight since. Though I am not in a position to disclaim all the apparent malpractices the coal-dealer is credited with, I think some of your statements are likely to lead to a misconception on the part of many people, and to do considerable harm to what may be, and is, upon the whole, an honest trade. No doubt, judging from the astonishing figures you have produced (which I do not wish to question in any way), much fraudulent deception is practised amongst the less scrupulous portion of the coal-dealing community. There are black sheep in every flock, yet they do not necessarily stamp the rest with a similar sinister brand. My motto is "Live and let live."

But, after all, I contend that the real "*Casus belli*" lies with the British public themselves, who have of late, seemingly, been suffering from an epidemic of the cheap and nasty fever. To meet the demands of the present public taste, the article in question must be cheap, and provided it *looks* good at a low figure, the public are sure to buy the cheap article in preference to the genuine thing at a fair price. This undoubtedly opens the way to a much larger amount of adulteration—and consequently profit—than is fair to the purchasers. Nevertheless, it is only what might be expected, when cheapness constitutes the market value of an article, and quality counts for nothing.—I am, &c.,

Coal Merchant.

To the Editor of the Chemical Trade Journal.

Sir,—It afforded me much pleasure to read the article on coal in your valuable paper a short time since. I myself have been looking up a few results which I have by me on this matter, which tend to corroborate your statements.

I have frequently met with ashes as high as 20% in ordinary house coal, and particularly during the recent strikes in the coal mining industries, was much interested to notice that the percentage of ash in the ordinary coal I was using, and have above mentioned as containing 20%, increased to as much as 50%. The conclusions are obvious.

I am very glad to see this matter has been ably taken up, and hope that it will lead to the subject being more perfectly ventilated and that it will ultimately lead to some definite remedial measures,—I am, sir, yours, etc.

H.S.F.W.

PHENACETIN ADULTERATION.

An incident that occurred recently in Elberfeld, Germany, has had the result of calling attention to the possible adulteration of phenacetin with acetanilide, says the *Apotheker Zeitung*. A woman after taking the second of five powders supplied by a druggist as containing each a gram of phenacetin, was seized with pains in the head, followed by symptoms of poisoning that required energetic treatment before they disappeared. As the patient had previously taken phenacetin with good results and without unfavourable by-effects, the medical man suspected a substitution, and investigation showed that the remaining powders consisted of equal parts of phenacetin and antifebrin or acetanilide. The local pharmaceutical association and chemical manufacturers, having been communicated with, took up the inquiry and further supplies of "phenacetin" were obtained from the druggist upon various written orders. As all these supplies proved to be of the same composition the case was brought under the notice of the authorities and a prosecution instituted. A charge of inflicting bodily injury fell through on the ground that the injurious action of antifebrin was not yet quite understood, whilst evidence was given that phenacetin had been known to produce similar symptoms in susceptible persons. Moreover, it was urged that hundreds of these powders had been taken without injury resulting. Subsequently the judge told the jury that the difference in the cost of the two substances for a single powder was so small as to put the question of adulteration for the sake of gain out of the question, and the druggist was acquitted. The *Apotheker Zeitung* remarks that the decision has not failed to arouse great surprise, and points out that at the time when, according to the defendant, he was supplying hundreds of the powders, the price lists quoted antifebrin at about £4 3s. the kilo, whilst phenacetin costs about £3 18s.

NOTICE.

We beg to inform our readers that the lecture on "Chlorine Production" announced for February 3rd, at the Manchester Technical Laboratory, will not take place.

This is rendered necessary by the fact that we are preparing a large working model of the plant to be used in our new process of "Sewage Treatment," which will be shown, in operation, at the lecture on

March 3rd, 1891, at 7 p.m.

We will reserve seats for this lecture for such of our friends who desire to be present and who will notify the same to us, and it may be well to state that we expect a large attendance.

Tea and coffee at 6-30 p.m. in the Exhibition room.

A WARNING TO TEA AND COFFEE DRINKERS.

Dr. A. J. H. Crespi, writing on Curiosities of Eating and Drinking, says:—"How singular to be warned that tea and coffee are more dangerous than alcohol, and that excess—though, what is excess?—in the former is worse, positively worse, than drunkenness caused by wine and beer. This, at any rate, is the conclusion drawn by Dr. Mendel, of Berlin. But he has been forestalled, and Brillat-Savarin, who really could write well, long ago assured us that Buffonand Voltaire drank enormous quantities of coffee to their deadly hurt, and that the descriptions which the former penned of the dog, the tiger, the lion, and the horse were written under strong cerebral excitement. He uttered the awful warning that a person of sound constitution might without danger take two bottles of wine a day, *pace* Dr. Richardson, throughout a long lifetime, but with the same indulgence in coffee he would become an idiot or die of consumption. But let us descend to particulars. "In Leicester Square, London," writes the author of the *Physiologie du Gout*, "I have seen a man whom the immoderate use of coffee had reduced to the state of a helpless cripple. He no longer suffered any pain, but had become accustomed to the state, and treated himself to five or six glasses a day." Brillat-Savarin, in his inimitable fashion, thereupon adds that to prepare himself for a severe task he once drank a larger quantity of coffee than usual, but, not having to grapple with the work he expected, had to pay for his rashness by not closing his eyes for forty hours, his brain all the while being on the rack, and "acting like a mill in motion with nothing to grind." But, pleasantry apart, every medical practitioner knows that the reckless consumption of hot tea, so common among the poorer classes of middle-aged women, is not unattended with inconvenience, in some cases, indeed, with actual danger, and much of the indigestion that makes their lives so miserable can be traced to their craving—a perfectly artificial one—for tea; at any rate, I have in hundreds of cases, succeeded in relieving many of these unhappy sufferers by stopping the supplies of tea for a few weeks.

THE MANUFACTURE OF GAS.

Parliamentary papers summarising the statistics of gas companies, and of local authorities engaged in the making of gas, during the twelve months ended on March 25th, 1890, show that the former are about twice as important, considering capital involved and work done, as the latter. The return embraces 405 gas companies, with an aggregate of 51¾ millions sterling of authorised capital, of which 38¼ millions is paid up. The receipts amount to 10¾ millions, and the expenditure to 7⅔ millions. They produced 64,278 million cubic feet of gas by carbonising 6,300,000 tons of coal. They sold nearly 60,000 million feet of gas, delivering it through nearly 14,000 miles of main piping, and they thus supplied 1,128,838 consumers and lit 268,000 public lamps. The returns relating to gas undertakings carried on by local authorities are all on a smaller scale. These concerns, at first sight, appear to be less economically worked; but the fact that the customers are smaller, and in proportion far more numerous may account for this. There are 173 centres of supply. The authorised loans amount to 24¾ millions sterling, of which 21⅔ millions have been borrowed. The receipts are five millions, and the expenditure 3⅔ millions. The gas manufactured amounts to 33,453 million cubic feet obtained by the carbonisation of 3,354,000 tons of coal. The gas sold amounted to 30,000 million cubic feet, which, passing through 7,700 miles of main, reached 1,115,267 consumers and 179,000 public lamps. Putting some items of these returns together, it would appear that 2¼ million consumers require about a hundred thousand million feet of gas.

THE EFFECT OF OILING WOOL ON THE DYEING PROCESS.

HORWITZ, in the *Farber Zeitung*, discusses this important point as follows:—Although the oiling of wool before carding is a necessary preliminary operation to spinning, it is nevertheless of great importance to the dyer, in so far as a proper selection of the material serving for oiling is essential to the production of an even shade. It is usually supposed that an admixture of resinous, mineral, and drying oils with the oiling materials causes some disturbances in the dyeing operations, and this has been proved to be correct, although the action of the substances mentioned has not yet been scientifically established. In practice their presence renders the production, especially of light shades, much more difficult, and is generally considered with some reason as one of the causes of the unevenness sometimes experienced on dyeing. Resin oils and mineral oils being unsaponifiable ingredients of the oil, are certainly injurious, because they cannot be removed from the woollen fibre by the usual process of treatment, and in the after dyeing process they are obstructive to an even impregnation of the colouring matter into the wool fibre. But this effect being probably produced by all other unsaponifiable fats, the condition made hitherto that the oils should contain no resin or mineral oils may be extended so far that they are to be free from any unsaponifiable fatty ingredients.

An unsaponifiable fat that the author has frequently found in wool oils is cholesterin, a sticky matter like pitch, and which easily crystallises. Its chemical formula is $C_{26}H_{44}O+H_2O$. The author has found from many trials that cholesterin is more obstructive to an even fixation of colouring matter on the wool than any other ingredient, and he therefore recommends that all oils used for oiling wool should be tested for cholesterin.

Olive oil is the principal oil used in this connection. The best quality is obtained by pressing the olives in the cold, or a second quality by boiling the olives, and hot pressing them. The latter quality is generally used for oiling wool. It consists chiefly of triolein (about 72 per cent.), palmitin, arachin, arachinic acid, and very little stearin. Schaedler states that it invariably contains cholesterin. With the usual methods of preparing the oil, the cholesterin passing into the oil will be very small in quantity, and the presence of such small traces will scarcely have any influence on the result. But if the amount of cholesterin should be about 4 per cent., as the author has frequently found to be the case, the oil is of the poorest quality, and has been obtained by unusual ways of preparation. In one instance the author having extracted cholesterin from dyed pieces, which were spotted, examined the olive oil that had been used for oiling the wool, and extracted 3 per cent. of cholesterin therefrom (?) The olive oils of commerce are, he avers, never pure oils. Adulterations with less expensive oils are very common. An addition of non-drying vegetable oils can only interest the spinner, while in dyeing it can scarcely have any bad result. An admixture of drying resin, or mineral oils, will, on the contrary, create some injurious effects in dyeing. In using adulterated oils it is difficult to say to what extent the oil may exercise an injurious influence on the dyeing operation.

One more point to be observed in connection with wool oils is, that they should not contain any free acid, which attacks the cards destroying them.

A MINERAL ORE DETECTOR.

A RECENT addition to the application of electricity to mining, and one which seems distined to find considerable use, is a portable device for detecting the presence and nature of a mineral where the latter is exposed in the rock or earth. This apparatus, which is intended for the use of prospectors more particularly, consists of a battery and spark coils, which are enclosed in a box, and the conductors end in two platinum points.

It is evident that if these points be connected to a conducting body and the circuit ruptured, a spark will be formed, the flame and colour of which will give some indication of the nature of the body which the electrodes have touched. Thus, by placing the two points against a rock containing metal in a free state, its presence may be detected by merely applying one electrode and passing the other rapidly over the surface.

The machine, which was invented by Mr. F. H. Brown, of Chicago, will, it is said, enable a novice or "tenderfoot" to pick up float rocks on the hills and tell instantly whether they contain mineral or not, and even the comparative quantity in a rough way. By means of this instrument, also, it is possible to find a lost "lead" in a shaft or cut by applying it to the walls. Another use to which it may be put is to the sorting of ores, the colour of the flame enabling the sorter to seperate the different kinds. The apparatus, which weighs about ten pounds, is arranged to be carried on the back and can be used to explode blasts in connection with electric primers.—*Electric Engineer.*

FUEL GAS AND SOME OF ITS APPLICATIONS.

(Abstract of paper presented at the New York Meeting of the British Iron and Steel Institute by Burdett Loomis, Hartford, Conn.)

THE advantages of gaseous fuel have been too fully set forth during the past few years to need recapitulation. Papers, arguments, and editorials have been issued, in a more or less general way, that would make volumes. Systems have found zealous advocates, and promises of results made, that have sounded strangely in the ears of old-fashioned gas makers, have been born of theory, and have died in the earliest throes of trial; while in some few instances success has demonstrated the value of practical effort. With few exceptions, however, everything attempted or accomplished has tended towards the one end—the realisation of more perfect results than we can obtain with the direct use of solid fuels: and there are to-day few to dispute the coming supremacy and general use of gaseous fuel.

It is not assumed that the solid fuels will be wholly superseded; such an assumption would be folly, as there are circumstances in which solid fuels must continue in use, from necessity or economy. These, however, are few, and can almost be named in a breath; while the purposes for which the gaseous fuel is not only cheapest, but best, are so many as almost to defy enumeration. Wherever constant high-flame temperature is necessary, the gaseous form must find precedence, while its easy carriage to long distances and its attainment of maximum temperature almost instantaneously with ignition, give it a leverage that is scarcely covered by that easy term—convenience.

The discovery and application of natural gas has not only borne the weightiest of testimony on behalf of the general necessity for fuel gas in nearly all fields, but it has done more. Its wide scope of service, from the great establishments wherein thousands use it constantly, to the cottage where it saves countless steps for the housewife, has demonstrated the necessity for a gas of general application, that will fulfil all the demands of the manufacturer, and meet the wants of the domestic user. The fuel gas that is to score a wide success must fill these conditions. For a gas that will not, the field is limited.

In the manufacture of a fuel gas, then, it is obvious that certain conditions are primarily necessary.

As concerns the apparatus to be used, these are:—

1. *Simplicity.*—It must be easily and cheaply worked, and require a minimum of skilled labour.

2. *Durability.*—It must do its work with but little repair or replacement.

As to the material to be used in the manufacture of the gas, the conditions are:

1. *Richness.*—It must contain the necessary carbon.

2. *Cheapness.*—It must be generally obtainable in large quantities at low prices.

These qualifications are met by the slack or fine bituminous coals, which are the least expensive of all coals, and are obtainable in nearly all markets at low rates.

These points established, it remains to decide upon the kind of gas to be made. This must be calculated to meet all the wants of those for whose uses it is intended. Here we find it necessary to consider the following:

1. *Quality.*—The gas must contain all the carbon possible, consistent with the other necessary conditions.

2. *Cost.*—It must be low in cost, especially in view of its use in large quantities.

3. *Cleanliness.*—It must be as free as practicable from impurities, and must be clean as regards those more perceptible.

4. *Transmission.*—It must be capable of easy carriage to reasonably long distances, and through small, as well as large, pipes.

5. *Temperature.*—It must have a constant high-flame temperature, and must ignite under all conditions, when desired.

For general adaptability to the wants of all classes of consumers, the requirements named must be met, and the more completely met, the greater will be the success of the gas offered.

In many cases, a good producer gas accomplishes all that is needed, and, used in a well-constructed regenerative furnace, is much cheaper than coal; but its usefulness is confined to places where such furnaces can be constructed, if high-flame temperature is required, or where low heats are sufficient, and obtained without regeneration. Outside of such confines, it is not economical, and is seldom useful.

Without discoursing on the relative merits of other gases, I believe that the gas best suited for general fuel purposes is water gas. Its flame temperature is high, it is cleanly, reasonably free from impurities, and it can be transmitted to long distances.

The one possible factor to which objection might be made is its cost. If it meets this requirement, there is no further bar to acknowledgment of its claims. Can it be made from the cheapest of materials offered in the general market for gas-making purposes? In discussing the lions in the path of success in this direction, the London *Journal of Gas Lighting*, some months ago, pronounced the following ultimatum:

"The slack, however wet, dirty, dusty, sulphurous or stony, should be tipped into the hoppers of the gas-making cupolas, and gasification should go on continuously and completely, so that nothing but gas and ashes should remain of the material put into the apparatus."

This can be done, and is done, in many places, with the Loomis apparatus, which is using the cheap coals mentioned, as well as the more expensive anthracite coals and coke. This apparatus is the only one that I know of in successful operation making water gas directly from the bituminous slack coals that are found in abundance in many parts of the world. It is a simple fuel gas-generating machine, and it will not only make as much water gas from a ton of this slack coal as can be produced by any other method from the same quantity of anthracite or coke, but it also utilises the blast gases for making the steam necessary to run the engines and exhausters, and for decomposing, leaving a surplus for other work; or the blast producer gas or generator gas can be used in regenerative, reheating, annealing, melting furnaces, &c. For these purposes the producer gas made by this apparatus answers all requirements, as can be shown by demonstration in the several places where it is so used.

Water gas generators, to be economical producers of gas, must be so constructed that they will continuously make a first-class quality of gas for the full period of a twenty-four hours' run. In all the generators using the up-blast system, after a few hours' run the quality of the gas has become much poorer than at the beginning, when the fires were fresh, on account of the clinkers and ashes that accumulate.

In the Loomis generator this is obviated, and the gas is of as good quality at the end of a twenty-four hours' run as at the beginning or any part of the run. This is due to the peculiar construction of the generator and the action of the exhauster in collecting the ashes at the bottom of the fire and in the ash-pit. In the process of exhausting before making a run of water gas, this is highly heated and useful for superheating the steam before it strikes the incandescent coal, and in this way the carbon is nearly all extracted from the coal, less clinker is made, the gas is freer from carbonic acid, and increased production is obtained.

In the matter of quality, a high grade of product should be aimed at, and the water gas made as pure as possible, so that it can be used, where practicable, without purification. In works where it must be purified, the better the quality of the gas the less the expense for purifying.

The claim has been made that the water gas that can be made from a given amount of coal must be less economical than the coal used directly, both on account of the smaller number of units of heat contained in the gas and the labour and expense of making. Where coal can be well fired, and gases economically burned direct from the furnace, this is in many instances true, but the great fields for water gas lie in the special uses for the many kinds of metallurgical work and kindred work where coal directly used cannot enter as a comparative factor, and for domestic purposes, where the gas is proving itself as cheap as the coal, if not cheaper, while it accomplishes results that are not obtainable with the solid fuel.

In estimating the economy of its general uses another factor must be considered. This is application. In this particular the threshold of investigation has scarcely been crossed, yet much has been accomplished, while the future is fruitful of certain realisation. Until lately the gas has not been obtainable for the purposes of experimenting in large quantities, and as yet, in special work, the methods of application are comparatively crude. Within the past few years, however, much has been done in the face of untoward circumstances, and you can now be shown the gas in use in many ways where it has supplanted coal, and wherein it has been found more economical than to fire coal, without taking into consideration any other features of advantage.

In nearly all branches of metallurgical work wherein the gas can be applied, however, there is found:

1. An increased product.
2. A better grade of product.
3. Direct economy in cost.

Increase in amount of product arises from the saving in direct labour, as can be most easily seen, perhaps, in forge shops and the like, and from the gain in the personal condition of the workmen, owing to the increased healthfulness of their surroundings.

The gain in grade of product arises chiefly from the uniformity in the temperature and the quality of the fuel.

The economy in cost needs no explanation. I may state, however, that in some large works which have changed from coal to the use of fuel gas, the gain in direct economy has been proved to be from 33⅓ to 50 per cent. in labour and over 40 per cent. in fuel.

In many instances the gain from having a sharp, quickly heating flame is such as to overbalance the question of more direct saving in cost of production, and it is not infrequently demonstrated that, by this means, workshop material enough is saved to alone pay all the productive cost of the gas.

Another feature worthy of consideration is economy of pace in locating furnaces or other appliances for the use of the gas, especially where it is desireable that these should be grouped together as closely as possible. It also renders possible the location of furnaces, heaters, forges, &c., just where desired, without necessity for considering the questions of convenience that frequently arise where there must be either coal carriage or storage.

With this, too, may be considered the fact that the heat from the gas is brought under closer control than that from the coal fires, and there is less heat generated into the room or space surrounding the point of application. This, perhaps, may seem of minor importance, but in these days of sanitary investigation and of shortening the days of labour, it will be found no little advantage to keep the temperature of the workroom as far as possible under control.

In many parts of the world inventors are devising new applications of this gas, and with marked success. It is so well made and so easily handled that its application in many new channels amounts to little more than ordinary manipulation and direction by those who understand the work to be done.

Among the several places in this country where the gas made by the process I have named has been applied to such a variety of uses as plainly shows its adaptability as a general fuel, as regards both efficiency and cost, are the saw works of Henry Disston and Sons, which you will be invited to examine on your journey from New York to Philadelphia. There you will see the generators at work on steady and continued runs, and will see the two gases, *i.e.*, the water gas and the producer gas that is made intermittently with the water gas, both carried to holders, and delivered under pressure at different parts to the works.

This is the first place of which I have knowledge where producer gas has been stored in a holder, and thence delivered cold to different furnaces at distances from the generators, being fired cold at such distant points. The process of manufacture and the manifold utilization of the different gases, but especially of the water gas, will be of interest. Full facilities for a thorough examination of the process of manufacture will be given, as well as full liberty to make any tests or experiments desired.

ESTIMATED COSTS OF 1,000,000 FEET OF WATER GAS BASED ON ACTUAL RESULTS, COAL AT 3 DOLS. PER TON.

Coal, 25 tons, 3 dol. per ton	75.00 dol.
Coal for steam, 3 tons, 3 dol. per ton	9.00
Labor	22.00
Extra for supplies and repairs	4.00
Purifying	5.00
	115.00
Received for producer gas	40.00
	75.00
Interest on plant and depreciation	25.00
	100.00

Cost per 1,000 feet, 0.10 dol.

In the practical using of water gas, 20,000 feet often accomplishes better results than a ton of coal directly fired; in some cases more is used.

This has been accomplished by new and improved methods of application, and will be improved upon as necessity demands and appliances are perfected.

I may say, in conclusion, that in no place where this gas has been put into use has any thought been given to a return to coal. The solid fuel, once supplanted, will never be sought for again.

Since the foregoing paper was written, the following actual result have been obtained melting brass in crucibles with water gas with improved furnace:

In melting 2,000 pounds of brass in 100-pound crucibles, 12,000 cubic feet of water gas was consumed.

In using some size of crucibles in works that are melting from five to ten tons per day with coal, it takes 2,000 pounds of coal for 2,000 pounds of brass.

Units of heat in 12,000 feet water gas used, 3,600,000.

Units of heat in 2,000 pounds coal used, 27,000,000.

Or seven and one-half times the amount that is in the gas used.

One ton of coal will make 40,000 cubic feet of water gas, which will accomplish as much as 3⅓ tons of coal in this work.

The cost of labour in making water gas will be less than in firing coal direct. The producer gas made, in addition to 40,000 feet of water gas from a ton of coal, will yield all the steam needed and pay interest and repairs on the plant.

The coal used for making the gas, being bituminous slack, only costs two-thirds as much per ton as that used with direct firing.

One ton of coal to make the gas, costing 3 dollars.

3⅓ tons at 4.50 dollars per ton will cost 13.50 dollars.

Saving on coal in melting 3⅓ tons, 10.50 dolars.

As it only requires two-thirds the time to melt with gas that it does with coal, here is a great saving, and less space is needed. Metal is not wasted in the ash, and crucibles will last much longer.

EXPERIMENTS ON FIRE DAMP MIXTURES.

A commission on colliery explosions, appointed by the French Board of Trade, has published a report on a series of experiments made by Messrs. Mallard, Le Chatelier, and Chesneau, mining inspectors and engineers, upon the effects of sparks produced by miners' picks striking hard rocks upon mixtures of air and fire-damp. For this purpose were used mixtures of pure formene and air, and of these mixed with ordinary illuminating gas, which were made by passing the gases through multiple Bunsen burners into a wooden box, placed against granite and porphyry blocks, so disposed that by striking them with a pick the sparks fell into the box. Mixtures of illuminating gas and air were easily exploded by the sparks whenever they were large enough to remain incandescent during an appreciable time, a result obtained with nearly every blow. The sparks are formed of metallic particles burning strongly and forming globules of magnetic oxide. With mixtures of formene and air no inflammation could be obtained, although more than a hundred experiments were made under conditions in which a mixture of illuminating gas and air would certainly have been ignited. This difference is probably due to the inflammation of formene requiring a much longer time than that of illuminating gas, and the sparks becoming cold before it can be effected. Further experiments were made with mixtures of formene, illuminating gas and air; when the mixture contained equal quantities of two gases, explosions were sometimes obtained, but with mixtures containing 75 per cent. of formene and 25 of illuminating gas, no explosion took place. As the best analyses of natural fire-damp show it to be composed of pure formene with only 3 to 4 per cent. of other gases, the commission concludes that ignition of fire-damp in collieries cannot be produced by sparks from miners' picks. The picks used were both steel and more or less steely iron; but besides these picks of steel, containing 13 per cent. manganese aluminum bronze with 8 per cent. aluminum and 2 per cent. silicon were tested. The former give off hotter and larger sparks than iron picks, and ignite explosible mixtures still more easily, while on the other hand, the aluminum bronze picks, whose hardness nearly equals iron, do not produce sparks, and could not be made to ignite any of the mixtures. This is rather important, as although the ordinary fire-damp may consist chiefly of formene, there is no certainty that no other gases may be enclosed in the coal and set free at times; and if bronze picks are absolutely safe they should, by preference, be used. By suitably mixing the alloy or treating it in forging, no doubt sufficient hardness for coal-mining purposes could be produced.—*Coal and Iron Trades' Review.*

COLD AIR REFRIGERATION.

A new system of refrigeration by means of cold air has just been inaugurated by the British and Foreign Refrigerating Company at their depôt, 15 Foley-street, Fitzroy-square, London. This system, which is mechanically simple and direct in operation, consists in first compressing the air, then cooling it, then expanding it, using it for refrigerating purposes, and returning it to the compressors for re-use. A very important feature of the system, however, is that the air during expansion is made to do useful work in driving the compressor engines. The plant consists of a pair of horizontal engines of 50-horse power nominal, but at present working up to 20 only. One of the cylinders is steam-driven, and to the rear of this cylinder, tandem fashion, is the air compressor, which is driven direct from the steam piston. From the compressor the air is conducted to a vertical cooling cylinder, which it enters at the bottom, and meets a shower of water descending from the top. By this means the air is deprived of the heat developed in compression, and passes on its way to the second cylinder of the engine. Here it expands, and in so doing does work by driving the piston and assisting the steam cylinder in the work of compression. The exhaust air from the cylinder is delivered into an intercepting chamber, from whence it is conveyed through wooden ducts to the refrigerating and cooling rooms, of which there are 15. These are maintained at various degrees of temperature, according to requirement. From each of the rooms there is a return duct leading to the compressor, so that the same air is used over and over again *plus* the air finding its way into the cold rooms from outside by leakage. We recently had the opportunity of inspecting the machinery and store rooms, which have been in operation for some two or three months. The chief practical advantages of the system are its simplicity of design and construction and economy of working. Next is its efficiency, which is shown by the satisfactory condition of the meat, game, and poultry stored under varying degrees of temperature. The working of the machinery, too, is to be commended. It is quiet and there is no snowing up of the parts. The intercepting chamber to which we have referred is intended to catch any snow that may be formed on expansion, but upon the occasion of our inspection there was practically none in the chamber. The plant in question has a capacity of 30,000 cubic feet of cold air per hour, delivered at a temperature of 75deg, below zero.

PERCENTAGE OF PHOSPHORUS REQUIRED IN THE BASIC BESSEMER PROCESS.

"H. M. H." writes in the *Engineering and Mining Journal:* "Many of us have doubted whether the basic Bessemer process was likely to be used extensively in this country, because few important ore beds contain enough phosphorus to yield a pig-iron sufficiently phosphoric for this process. In the acid Bessemer process, the necessary heat is supplied by the oxidation of the silicon of the pig-iron. It is not expedient in the basic Bessemer process to use a pig-iron containing much silicon, and the heat needed must come from the oxidation of phosphorus and manganese—perhaps supplemented by iron. Hence a highly phosphoric pig is deemed essential for the basic Bessemer process. But we find that, in the acid Bessemer process, thanks to our very rapid running, to the consequently very short intervals between blows, and to the small loss of heat by radiation from the converter during those brief intervals, the pig-iron need contain only about one-third as much silicon as is needed in European acid Bessemer practice. Under favourable conditions we blow iron with only 0·70 per cent. of silicon. Now, I want to point out that the very same cause, short intervals between heats due to rapid running, which has led to our using, in the acid Bessemer process, pig-iron with only one-third as much silicon as is needed in Europe, may in the future lead to our using, in the basic Bessemer process, pig-iron with only one-half or even one-third as much phosphorus as is needed in Europe; and that, hence, the particular reason for doubting whether we can use the basic Bessemer process extensively in this country, loses its force, for we have plenty of ore beds which will yield a pig-iron containing one per cent. of phosphorus."

BLEACHING AND FIREPROOFING FABRICS.

ANY suitable chemical, says a contemporary, may be used, as, for instance, borax, soda, alum, chloride of sodium, and other chemical that would have the desired effect. After the solution is applied, the fabrics are formed into bundles or rolls, while yet damp with the solution, and stored away in this damp condition, when a chemical action takes place in the mass, which effects the bleaching of the fabrics, and renders them whiter than they would be if the same solution were applied and the fabrics dried before being formed into bundles or rolled up. The bleaching of the fabrics is not the only result, but it also renders the fabrics fireproof, and makes them softer and more pliable, and thus adds also to their value. As an example of a suitable solution per yard of the fabric, 2½lbs. of chloride of sodium, dissolved in 7½lbs. of water, has been found to give good results. The invention is particularly applicable to the manufacture of bagging from jute butts, and it will be far superior to that heretofore produced from this article, in that it is lighter in colour, as well as much superior in appearance. By applying the solution while the goods are on the calender, it does not come in contract with the spinning and weaving machinery, which would cause them to rust, and by applying it while the goods are on the calender, and just before being rolled up, a very thorough and even distribution of the chemical through the goods is obtained. As before stated, the rolls are stored away as they come from the calender, and in a damp condition, produced by the application of the chemical, and the result is that a chemical action takes place in the tightly rolled goods, which very materially improves the colour of the article, and adds much to its value, but practically nothing to the cost of its production.

ESTIMATION OF THE ZINC AS CARBONATE AND SILICATE IN LEAD-BEARING CALAMINE.

MR. W. Minor describes in *Chemiker Zeitung* 14, 1003, his improved method of determining the zinc existing as carbonate and silicate in calamine ores containing lead. Two drams of calamine are boiled with 50 to 60 c. c. of dilute caustic soda solution for about 15 minutes, the insoluble matter is allowed to settle, the liquid filtered, and the residue again boiled with soda as before. The second liquid is also filtered, and the residue washed on the filter with hot dilute soda. The filtrates are added together, acidulated with sulphuric acid to remove the lead, made up to a known bulk, and, after standing several hours, half of the liquid is filtered. This solution is then made alkaline with ammonia and the zinc estimated by titration with sodium sulphide. Since the greater part of the zinc existing as sulphide in calamine ores is lost during the smelting, a method for determining that combined with carbonic and silicic acids only is of great importance. It is not necessary after adding the ammonia to filter off any alumina that might be precipitated.

THE FLORIDA PHOSPHATE FIELDS.*

By H. Robinson, M.D., of Jacksonville.

DURING the summer of 1887, whilst the U. S. Government survey was being made of Peace River, Fla., which is situated in the southern part of the state near Charlotte Harbour, two members of the surveying party were attracted by the peculiar pebbles abundantly found in the bed of the river. They sent some of the pebbles to a chemist to be analysed; on receiving a report that these specimens were phosphate coprolites they made a more extensive investigation, and to their gratification found that the supply of coprolites was immense. They then quietly purchased the greater part of the land embracing the banks and bed of the river, made arrangements with fertilizing companies for the disposal of the phosphate, and proceeded to erect works for mining it. Their operations attracted but little attention either at home or abroad; they in the meantime amassing a fortune.

In June of 1889, a farmer at Dunellon, a village in Marion county, was digging a well for water on his homestead, and as he had an idea that his land contained gypsum, he carried some of the rock that was thrown out of the well to Ocala, the county seat, and showed to Mr. Snowden (a graduate of the N. Y. College of Pharmacy) the specimen of the so-called gypsum. Mr. Snowden made an analysis of the rock and ascertained that it was composed principally of phosphate of lime. This important discovery was communicated to Mr. J. F. Dunn, (a capitalist of Ocala) who sent some of the specimens to a St. Louis firm of chemists for further analysis.

Their report confirmed Mr. Snowden's analysis, and recommended that further search be made; whereupon Mr. Dunn purchased through his agents thousands of acres of land at nominal prices, from one dollar to five dollars per acre, till he controlled, as he supposed, all the land that was likely to be underlaid with phosphates.

About the beginning of the present year he made his discoveries and purchases public, whereupon an excitement arose throughout the State, that can only be compared to the gold discoveries in California. Old and young, black and white, males and females throughout the whole State abandoned their usual pursuits of life in search of phosphates. The whole State was honeycombed with augerborings; pits were dug in every field.

As a result of these borings it was demonstrated that the phosphate fields in Florida were practically unlimited; the mineral underlays pretty much of the whole State. Lands that sold last autumn at a dollar an acre, sold readily for 50 dollars to 100 dollars per acre. Eager buyers from every part of the Union rushed into the State, and purchased without even an examination of titles or a survey of the lands, paying any price asked rather than lose the opportunity. Yet none have regretted their investments. Vast sums of money changed hands, and more discoveries were being made. At the present time the fever has somewhat abated, but it is still raging fiercely. Large investments are yet daily being made, but more judiciously than before; locality and transportation facilities are now considered as a factor in the price of lands, and values are becoming more stable.

The Dunellon phosphates (so-called because first there discovered) are found principally in the southern portion of central Florida, comprising the counties of Marion, Citrus, Levy, and Alachua, also Lafayette and Walculla counties. The non-metallic mineral is in appearance, usually perfectly white, similar to limestone rock. It is composed of, on an average, bone phosphate of lime 75 to 85 per cent. and alumina and iron oxide each from 2 to 3 per cent., and the remainder of carbonic acid and silica.

There are also in almost every other part of the State, pockets of a similar formation of a lower grade; and marl beds containing about 10 to 20 per cent. of phosphate of lime, are in great abundance everywhere.

In the southern part of Marion county, and the northern part of Citrus county, adjoining, the phosphate rock extends from the surface, or 1 to 2 feet from the surface, in solid beds from 5 to 20 feet underground in depth. That obtained from the surface of the land is usually laminated, of a greyish white colour, of very high percentage of phosphoric acid; lower down the rock continues to show evidence of lamination, and is of snow white colour; as we proceed, however, 10 to 15 underground, all evidence of lamination disappears, and the rock, still white, is soft, and has the consistency of chalk—it then contains a large quantity of carbonic acid, and less phosphoric acid.

The theory of its formation advanced by some scientists is that the whole section of Florida, where this variety of phosphate rock is found, was, when under water, in the tertiary epoch, underlaid by the so-called Vicksburg limestone, became saturated with the urinary and fœcal deposits of marine animals and fishes, and that the remains of these animals and fishes were imbedded in the limestone, and thus the rocks were gradually phosphatised. This theory does not seem plausible, for it presupposes that the affinity of lime for phosphoric acid is greater than it is for carbonic acid, which has not been proved.

This variety of phosphate rock is, by the aid of pickaxes, mined in large boulders, frequently weighing from 500 to 1,500 pounds each. This is loaded in freight cars and shipped to be manufactured into soluble or acid phosphate for manuring purposes.

In the counties of Polk, Hillsborough and some other counties, the phosphate is intimately intermixed with sand or clay, and can be made available only by separating the phosphate from the matrix by the use of hydraulic power, which, as yet, has not been attempted.

In the county of De Soto, which is traversed by Peace River and its tributaries, the soil, either sandy or clay, is loosely mixed with large quantities of coprolites. No white rock like it in other parts of the State has been found.

Peace River is a shallow and tortuous stream; its bed and banks are formed of nearly equal parts of fine sand and phosphatic coprolites. The coprolites are of a dark colour, either blue or gray, very hard, of smooth texture, and vary in size from that of the smallest millet seed to that of a hen's egg. The average percentage of bone phosphate of lime of these coprolites is about 65 to 75. There is no question as to the origin of the deposits. They bear every evidence of being composed of fœcal matter exclusively. Large beds of bones, some of gigantic size, are frequently found in or near the river; some of these bones were evidently those of elephants and mastodons. Shark bones and teeth are very abundant in the river bed, also those of the manatee and alligators.

In the bed of the river are frequently vast banks of sand and coprolites intermixed, in about equal proportions. They vary from a few yards to a half of mile in length, and from 5 to 15 feet in height, protruding out of the water. The bed of the river has been dredged for 18 feet below the water and the supply of coprolites has increased as the dredging progressed. During rains the coprolites are washed out of the lands and little streams tributary to the river, into its bosom, and thus the supply is continuously increased.

The mining of the phosphate is done with dredge-boats only. A rubber suction pipe capable of lifting a ton of matter every three minutes is attached to the rear of the boat; this is lowered into the water, the sand and phosphate lifted is put into barges, carried to a mill, thence elevated and emptied into a screen, and sifted so as to separate the sand from the coprolite, then lowered into a railroad car, and shipped to be manufactured into superphosphate of commerce.

Analysis made by the writer of a choice sample of laminated Dunellen phosphate:—

	Per cent.
Lime	53·31
Phosphoric acid	33·40
Sand	6·32
Iron sesquioxide	3·05
Alumina	2·40
Carbonic acid and loss	0·72
	100·00

Analysis of an average sample of Peace River coprolites:—

	Per cent.
Lime	58·40
Phosphoric acid	27·70
Insoluble matter and sand	9·60
Sesquioxide of iron	1·85
Alumina	1·40
Carbonic acid and loss	1·05
	100·00

* Read before the American Pharmaceutical Association.—*Oil, Paint, and Drug Reporter.*

SILVER IN VOLCANIC ASHES.

THE existence of silver in volcanic ashes is of rare occurence. Only in two cases have argentiferous ashes been met with. The first sample was obtained during an eruption of Cotopaxi in July, 1885, in the ashes of which Mr. J. W. Mallet proved the existence of one part of silver in 83,000 parts of ashes. In the following year the same investigator was able to add a second instance. In January, 1886, a violent eruption of Tunguragua, in the Andes of Ecuador, between 50 and 55 miles from Cotopaxi, took place, the eruption continuing at longer or shorter intervals up to November of the same year. The ashes thrown up by this volcano, which had been at rest for over a century, contained silver to the extent of one part in 107,200 parts of ashes. This appears, at first sight, to be only a very small percentage of the metal; but when it is considered what enormous quantities of ashes are erupted, and what a vast extent of area they cover after an eruption, the quantity of the silver thrown up with them must be considerable.

THE ELECTRO-TECHNICAL USES OF PLATINUM.

THE price of platinum has risen very considerably during the last two years, and now amounts to 2,750 francs (£110) per kilo, whereas two years ago it was only £36. This increase of price is connected with the great demand for platinum for many electro-technical purposes, in comparison with which that of other industries is only trifling.

The amount of platinum which is annually obtained from the various mines, is according to the *Lum. Electr.*, 2,800-3,000 kilos. Three-fourths of this quantity are yielded by the Nischne-Tagilsh mine, on the eastern slopes of the Ural mountains. The main portion of the total supply is got in this district, Columbia, Australia, Peru, Canada, etc., being of secondary importance.

Platinum is employed in chemical industry, in gold working, in jewellery, and for physical and surgical instruments. Its application in the large scale dates from the introduction of the incandescent lamp, since platinum is the only metal which can be readily fused into glass, and which expands to the same extent as glass when heated, so that fractures are not to be feared.

Considering that incandescent lamps became useless after a certain number of hours' employment, it is apparent that the number of lamps employed must be enormous—the United States of North America have for example 3 million, and England 300,000 lamps in use, apart from the large number employed on the continent, and the amount of platinum required being proportionately great, the rise of price to three times its original height can readily be understood.

In addition to the manufacture of incandescent lamps, platinum is much used for electro-chemical purposes when unalterable electrodes are wanted to receive metallic deposits.

It is usually most important that the anode should be unoxidizable, and in this respect platinum has proved better than gold, especially in the presence of substances containing chlorine, provided that the liquid be not raised to too high a temperature. Platinum is therefore used, in amongst others, the electric method of bleaching, which will, no doubt, at some time, become an industrial process.

The numerous experiments with electrodes of other metals, covered with a thick film of platinum have not led to any satisfactory results and platinised glass or porcelain has also proved a failure.

Gas carbon, the only substance which can be used in the electrolysis, of fused substances for the production of chlorine or chlorine salts, and which is scarcely altered by fused salts cannot replace platinum, because it finally becomes brittle in salt solutions. It has not, moreover yet been found possible to prepare an artificial carbon which is not porous.

Platinised electrodes have been tried, and not without some success, but the preparation of such electrodes is very troublesome and cannot, as yet, be considered feasible from the industrial point of view.

Recently, unalterable electrodes have been introduced, and used in the electric bleaching process, which consist of copper plates, on which a firmly adhering film of lead peroxide has been deposited from a solution of litharge in potash. Nothing is, however, at present known as to the results of this innovation, and we are therefore justified in saying that hitherto, no effective substitute for platinum has been found for electro-technical purposes, and for the manufacture of incandescent lamps. —*Chem. Tech. Cent. Anzeiger.*

A CHEMICAL FIRE ALARM.

AMONG the various devices suggested for giving warning of a dangerous rise of temperature in coal-stores, in connection with machine bearings, and indeed wherever spontaneous or accidental heating is to be dreaded, must now be included an appliance called an "Admonitor," the invention of Mr. Agerskov, of Copenhagen The device consists of a copper cylinder resembling in size and appearance a pistol cartridge. It is therefore unobjectionable on the score of bulk and also on that of expense; the little appliance being so simple and cheap that many may be procured for the price of one long-distance alarm thermostat of the usual type. The copper cartridge shell is closed at one end, and stopped at the other by an indiarubber button. It is filled with a slowly-burning composition of high illuminating power, on the top of which is placed a fuse composed of a mixture of two parts of chlorate of potash and one part of sugar. In this mixture is imbedded a drop of concentrated sulphuric acid enclosed in a film of paraffin. The almost perfect insolubility of paraffin in sulphuric acid assures the integrity of the little capsule so long as the temperature remains below the melting-point of the paraffin. This is about 135 deg. Fahr.; and when the temperature of the place in which the "Admonitor" is placed rises to this point, the paraffin gives way, permitting the sulphuric acid to act upon the chemical fuse, which ignites the luminous composition—the plug being at once driven out, and the alarm given by the light. By a slight modification of the device, it is also made to sound an alarm; while by a small additional complication, the flame is caused to melt a fusible metal disc, and thereby liberate a spring which closes an electric circuit, and thus telegraphs warning of heat to any distance. The special ingenuity of the device is in the preparation of the sulphuric acid and paraffin capsules.

Trade Notes.

A PROCESS OF MAKING HYDROGEN PEROXIDE. — The method consists of making hydrogen peroxide under pressure, the said pressure being obtained either by confining upon the surface of the forming mixture that portion of the nascent hydrogen peroxide which ordinarily escapes into the atmosphere until this self-formed pressure prevents further escape or by forcing air into the containing vessel until sufficient pressure has been obtained to prevent all effervescence of nascent hydrogen peroxide, when the reaction can be conducted without loss.

SOLUBILITY OF MINERALS.—Mr. C. Doelter has determined the solubility in distilled water of minerals which are usually considered as insoluble—*Journal Chem. Soc.* The following were used in the investigation :—Pyrites, galena, blende, antimonite, arsenical pyrites, bournonite, copper pyrites, tinstone, rutile, specular iron ore, heulandite, anorthite, natrolite, and chabasite. The samples, reduced to a fine powder, were placed in sealed tubes, and heated at 80 deg. with distilled water for several weeks. All the minerals proved to be more or less soluble in water, the sulphides, rutile, and tinstone showing the greatest solubility. The presence of sodium fluoride raises the solubility of rutile, tinstone, and specular iron ore, but sodium chloride does not produce a like effect. Carbonic anhydride increases the solubility of the oxides and sulphides; sodium sulphide and hydrogen sulphide that of the sulphides, especially antimonite.

LIQUID BRONZE.—J. E. Stroschein in Berlin has discovered a solution in which bronze powder is held in suspension for a long time. Damar resin is melted after about one-third of carbonate of potassium, free of water, or carbonate of soda has been added and stirred for about three days to keep it thus. Then the alkali containing resinous mass is powdered finely, scattered in thin layers on hurdles, exposed to a temperature, about 50° C. and left in it during several months. The resin thus gained is dissolved in benzene or another distillate of naphtha under a boiling-point of 150° C. after dry ammonia gas has been led though the solvent, to render innocuous any residual acid The bronze-powder remains suspended in this lac-varnish. Articles bronzed with it, are said to retain for years together the original fresh metallic lustre. This process is patented in the German Empire.

CHIMNEY DRAUGHT.—At a recent meeting of the American Institution of Mechanical Engineers, Professor R. H. Thurston read a paper on "Chimney Draught; Facts and Theories." He discussed the question whether there exists a temperature of maximum delivery, and gives the results of an investigation made under his directions, with a chimney 20 inches in diameter, and 32 feet in height, to determine whether there was any maximum at about 600 deg. Fah., such as the commonly received theories give. The result in some cases showed an apparent maximum at about 300 deg. Fah.; but in other cases showed no maximum within the range of temperatures observed, or up to 1,000 deg. Fah. The paper criticises the form of Rankine's formula, and frames a new theory which indicates that the temperature of maximum draught will be rarely found at less than 700 or 800 deg. Fah., or very probably, 1,000 deg. Fah. The author admits, however, that the conditions involved are so numerous and so variable, that it is doubtful if any analysis can be made which will be sufficiently simple, convenient, or accurate to come into general use in the solution of the problem, and that current successful practice rather than theory must continue to be our guide in the design of chimneys.

Market Reports.

THE TYNE CHEMICAL REPORT.

MONDAY.

There is very little doing in the chemical market, and for all practical purposes it may be said that there will not be much more business transacted until the turn of the year.

Most of the chemical works on Tyneside cease producing on Christmas eve, and do not resume work until after New Year's day, and, as is usual at this time, makers take advantage of the stoppage to have

their plant overhauled and the necessary repairs effected. The market will then be relieved to the extent of from 7 to 10 days' make, so that the slight demand existing at the moment, will be counterbalanced by the decreased production.

The following are the market quotations of to-day:

Bleaching powder, in softwood casks, £6. 15s. per ton, less 3½%; in hardwood casks, 5s. per ton, extra. Caustic soda 77%, £12. per ton, nett; ground and packed in 3-4 cwt. barrels, £16. per ton, nett; 70%, £11. 5s. per ton, less 3½%; white alkali, 1⅝d. per degree, less 2½%; soda crystals, 56s. per ton, nett; sulphate of soda, in bulk, 42s. 6d. per ton; ground and packed in casks 53s. per ton, both less 3½%; recovered sulphur, in 2 cwt. bags, £5. 5s. per ton, nett; chlorate of potash 5½d. per lb., less 5%; silicate of soda 75° Tw., £2. 15s. per ton; 100° Tw., £3. 10s. per ton; 140° Tw., £4. per ton; hyposulphite of soda, in 1 cwt. kegs, £6. 10s. per ton; in 5-7 cwt. casks, £6. per ton; pure white sulphate of alumina, £4. 10s. per ton; blanc fixe, £7. 10s. per ton; chloride of barium, £7. 15s. per ton; nitrate of baryta crystals, £18. 15s. per ton; ground, £19. 5s. per ton; sulphide of barium, £5. 10s. per ton; carbonate of alumina, £27. 10s. per ton; aluminate of soda, £32. 10s. per ton; hydrate of barium, £8. 10s. per ton. All f.o.b. Tyne, or f.o.r. makers' works.

The market for Northumberland steam small is again easier and some qualities offering as low as 4s. 6d. per ton, delivered into craft; superior qualities run from 5s. 6d. to 6s. per ton. Durham small continues steady without alteration, viz., 6s. 6d. to 7s. 6d. per ton, delivered into craft.

THE LIVERPOOL COLOUR MARKET

Colours are quieter. Ochres: Oxfordshire, common, £10, medium, £12., best, £15.; Derbyshire, common, 40s., medium, 50s., best, 60s.; Welsh, best, 50s., seconds, 47s. 6d., and common, 18s.; Irish, Devonshire, 40s. to 45s.; French, J.C., 55s., 45s., to 60s.; M.C., 65s. to 67s. 6d.; Umber: Turkish, none offering. Devonshire, 50s. to 55s. White lead, red lead, and oxide of zinc still firm. Venetian red, £6. 10s. Cobalt: Prepared oxide, 10s. 6d.; black, 9s. 9d.; blue, 6s. 6d. Zaffres: No. 1, 3s. 6d.; No. 2, 2s. 6d. Oxide of iron: Good inquiry; common, £6.; medium, £10.; finest, £20.

WEST OF SCOTLAND CHEMICALS.

GLASGOW, Tuesday.

Except in one or two specials, which are always more in request during midwinter than at any other time, there is little of what can be called activity on the market, and prices, if on the move at all, are inclined perhaps to give, but in no case more than fractionally. In the paraffin section the chief feature durtng the past few weeks consists in the heavy deliveries of burning oils from works, on account of past-made and still unexhausted contracts; and the wholesale strike of Scotch railway employés, entered upon on Saturday last without specific warning given, threatens to bear very heavily here, and with disastrous effects both to makers and consumers, if the strike is protracted. The article has been long weakly, and if shunted during the short space when there was chance of partly making up leeway, its case will be very bad indeed. The other paraffins have all been robust, and as they go into considerably less bulk they can stand some congestion without serious harm. Sulphate of ammonia has not managed to improve position during the week, but has rather lost. On Friday last there was a spot sale at £10. 11s. 3d., Leith, and that is about the value now, although, so far, there seems to be no buyers this week, and in view of exceptionally low nitrate rates it may drop further. The bichromate makers are still badly off for orders, and still more liberal discounts are offered.

Chief prices current are: Soda crystals, 56s. net Tyne; alum in lump £5. 2s. 6d., net Glasgow; soda ash, 1⅜d. less 2½%, Tyne; caustic soda, white, 76°, £13., 70/72°, £11. 5s., 60/62°, £10., and cream, 60/62°, £9. 12s. 6d., all less 2½% Liverpool; bicarbonate of soda, 5 cwt. casks, £7., and 1 cwt. casks, £7. 5s., net Tyne; refined alkali, 48/52°, 1⅜d., less 2½%, Tyne; saltcake, 40s.; borax, English refined, £29. 10s., and boracic acid, £37. 10s., net Glasgow; bleaching powder, £6. 7s. 6d. to £6. 15s., less 5% f.o.r. Glasgow; bichromate of potash, 3¾d., less 10% for Scotch and English deliveries, for export 3½d., less 10%, f.o.b. Glasgow; bichromate of soda, 2¾d., less 10%, export 2½d., less 10%, f.o.b. Glasgow; chlorate of potash, 5½d., less 5% any port; nitrate of soda 7s. 7½d. to 7s. 9d; sulphate of ammonia, £10. 10s. to £10. 12s. 6d. f.o.b. Leith; salammoniac, first and second white, £37. and £35., less 2½% any port; sulphate of copper, £18. 5s., less 5% Liverpool; paraffin scale, hard 2¾d., and soft 2⅝d., per lb; paraffin wax, 120°, semi-refined, 3⅜d. to 4d.; paraffin spirit (naphtha), 9d. a gallon paraffin oil (burning), 6d. to 6¼d. at works for Scotch buyers (English orders about a penny less); ditto (lubricating), 865°, £5. 10s. to £5. 17s. 6d.; 885°, £6. 5s. to £6. 10s., and 890/895°, £7. 10s. to £8. Week's imports of sugar at Greenock, were 18,024 bags.

THE METAL MARKETS.

BARROW-IN-FURNESS, SATURDAY.—There is a rather better tone in the hematite pig iron trade this week, and better prospects are showing themselves for the New Year than have been apparent for some time. The output of the furnaces is steadily maintained, and all the iron produced by the 49 furnaces in blast is going into consumption, and in addition to this, stocks of hematite warrants are being reduced. The decrease this week represents 3,000 tons, making the decrease from the beginning of the year, 162,000 tons. Prices are rather steadier, and show a slight advance, warrants being quoted at 54s. 4d. nett cash, while makers are asking 55s. for parcels of mixed Bessemer numbers, nett, f.o.b., and 51s. 6d. for No. 3 forge and foundry iron. The steel trade displays a more cheerful tone. The Barrow Steel Company have secured a large order for heavy rails from the New South Wales Government. A few other good enquiries are in the market. Prices are easier at £4. 17s. 6d. to £4. 18s. 6d. per ton for heavy sections, £6. to £6. 10s. for light sections, and £7. 10s. for colliery rails. Business in steel for ship-building purposes is steady. The local demand is strong, and there is a good enquiry on general account. Prices are steady at £6. 12s. 6d. for plates, £6. for angles and other sections, and £7. 12s. 6d. for steel boiler plates. Hoops are in good demand at about £6. 10s. Blooms, slabs, and billets are a steady though not brisk trade. Ship-builders and engineers are doing a very good business industrially, and it is understood when the present large orders are out of the way, others will be ready to take their place. Iron ore is brisk at 11s. 6d. to 12s. per ton, nett, at mines. Coal and coke in good demand at full prices. Shipping is fairly employed at average freights.

BIRMINGHAM, SATURDAY.—There is great activity in the hardware branches, and every energy is being put forward to clear off orders from the books before the holidays begin. For the New Year, however, the outlook is not very encouraging, as the orders coming to hand are very trifling. Bedstead makers have been very busy, and the M'Kinley tariff does not appear as yet to have had the effect of checking the sale of English bedsteads in the United States. Prices, however, are somewhat weak and irregular, owing to the relapse in iron and the reduction in certain kinds of tube. The wrought-iron tube branch is rather quiet for the season, which is generally favourable to the gas tube branch. In steam and water tubes there is a fair amount of business, and the makers both of close and soldered tubes are also busy. For steel grinding and crushing mills there is a fairly strong demand both for home and export. Mincers and sausage machines are also in good request, as usual at this season. In the lighter trades overtime has been worked for some time past. Makers are fairly well off in the iron trade. Prices show no change on the week, though they remain tolerably firm on the basis of £8. 10s. for bars.

LEEDS, SATURDAY.—Until the turn of the year there will not be much new business. Everybody is now taking stock or preparing for the operations, and consequently very few orders, and none of importance, have been given out lately. Still the majority of manufacturers have large contracts on hand, some of which will take a few months to complete, and in the meantime it is expected that a fresh impetus will have been given to trade. There are few engineering firms which are not well supplied with orders, and both iron and steel makers are doing well. The coal trade keeps active, and prices are about the same as they have been for some time past. The wintry weather which has now set in will give a fillip to the house coal trade.

LONDON, SATURDAY.—There was very little doing in the mining market to-day. In Copper Shares Rio Tinto fell ⅛ to 23⅛, and Mason and Barry ⅛ to 7⅛. The South African market was quite idle.

THE LIVERPOOL MINERAL MARKET.

Notwithstanding the approaching close of the year, when manufacturers do not wish to increase stocks, our market has been brisk. Manganese: Arrivals have considerably improved; prices remain firm. Magnesite: The enormous large stocks of raw lump have not been reduced. Sales are slow at low figures. Raw ground, £6. 10s., and calcined ground £12. 10s. Bauxite (Irish Hill brand): continues steady, bringing full prices. French chalk: Arrivals continue small, as usual at this time of the year; prices remain firm, especially for G.G.B. "Angel White" brand, 97s. 6d. to 105s. medium, 110s. to 120s. superfine. Barytes: Carbonate easy; whilst sulphate of fine

quality is in demand, "Angel White," No. 1, 70s.; No. 2, 60s. to 65s.; No. 3, 45s. Pumicestone: Lump and ground steady. Iron ore in fair demand, as well as manganiferous and Santander; Irish and Cumberland in good demand at full prices. Emerystone: Best brands continue to be inquired for. No. 1 lump £5. 10s. to £6., smalls £5. to £5. 10s. Fullers' earth: More inquiry; 45s. to 50s. for best yellow; fine impalpable ground, £7. "Emerald" ground 80s. Scheelite, wolfram, tungstate of soda, and tungsten metal in request at fair prices. Chrome ore: High grades in demand for prompt forward delivery. Antimony ore and metal firm as last quoted. Asbestos firm, especially Canadian rock. Potter's lead ore more doing; "Standard" brands steady; smalls, £13 to £14.; selected lump, £15. to £16. Calamine of best quality in request at good prices. Strontia sulphate (celestine) steady, 15s. 6d. to 17s. Carbonate (native), £15. to £16.; powdered (manufactured), £11. to £12. Limespar: A good business doing; English manufactured, old G.G.B. brand in request at 50s. (ground). Felspar and fluorspar, quieter. Plumbago: Best qualities sought for; Spanish, £6.; best Ceylon lump at last quotations; Italian and Bohemian, £4. to £12. per ton. "Founders," £5. to £6.; Blackwell's "Mineraline," £10. French sand, in cargoes, 20s. to 22s. 6d. Ground mica, £50. China clay easier; common, 18s. 6d.; good medium, 22s. 6d. to 25s.; best, 30s. to 35s. (at Runcorn). Bog ore (oxide of iron), scarce as usual at this time of the year; finest quality 22s.

The Patent List.

This list is compiled from Official sources in the Manchester Technical Laboratory, under the immediate supervision of George E. Davis and Alfred R. Davis, who report professionally upon the value of Chemical Patents.

APPLICATIONS FOR LETTERS PATENT.

Apparatus for Storing and Discharging Compressed Gases. J. Cox. 19,979. December 8.
Smoke Consuming Furnaces. H. J. Haddan. 20,007. December 8.
Treatment of Soda Waste. F. Ellershausen. 20,012. December 8.
Charging inclined Gas Retorts. L. V. Vestraut 20,030. December 9.
Steam Generators. J. Blake. 20 035. December 9.
Mechanical Stoking. J. Whitehead. 20,039. December 9.
Apparatus for Treatment of Refuse Fuel J. Turner. 20,058. December 9.
Purifying Feed Water. J. B. Edmiston. 20,084. December 9.
Filtering Apparatus.—(Complete Specification.) H. Roeske. 20,095. December 9.
Pulverising Apparatus. H. W. Carter, S. B. Heward, R. S. Moncrieff, and T. A. Richardson. 20,097. December 9.
Dynamos. A. S. Baxendale. 20,102. December 9.
Electrolytic Apparatus.—(Complete Specification). H. H. Lake. 20,111. December 9.
Recording Pressure Gauges.—(Complete Specification). J. Y. Johnson. 20,117 December 9.
Galvanic Batteries.—(Complete Specification). C. E. Dutton. 20,126. December 10.
Salt Grinding Machinery. S. Rushton, E. Blades, and W. Holden. 20,133. December 10.
Cleaning Tin and Terne Plates. J. Jenkins. 20,136. December 10.
Resins and Varnishes. A. F. St. George. 20,145. December 10.
Smoke Consumption. G. Ralston and W. P. Bainbridge. 20,154. December 10.
Mechanical Stokers. J. Murrie. 20,161. December 10.
Chemical Detergents. D. Clark. 20,164. December 10.
Evaporating or Drying Apparatus. F. M. Robertson. 20,166. December 10.
Electric Meters. A. Frager. 20,175. December 10.
Concentration of Saccarhine Liquids. H. Macmillan. 20,181. December 10.
Feed-water Heaters. J. Gilmour. 20,192. December 10.
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Photographic Negative and Print Washers. A. Palmer. 20,199. December 10.
Saggers for Firing Pottery Ware. C. F. Bailey. 20,207. December 10.
Smoke Prevention. W. H. Hill. and W. Green. 20,213. December 10.
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Cleansing Animal Fibres. A. Ambler, S. Ambler, and F. Ambler. 20,267. December 12.
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Insulating Compositions for Electrical Uses.—(Complete Specification.) T. D. Bottome. 20,289. December 12.
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Obtaining Vegetable Fibres. D. Barnett. 20,334. December 13.
Apparatus for Feeding, Heating and Burning Fuel in Furnaces. J. Murrie. 20,336. December 12.
Sterlizing Apparatus.—(Complete Specification.) E. Cohen. 20,348. December 13.
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Manufacture of Steel. H C. S. Dyer. 20,393 December 13.
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Electrolysis of Chloride and other Solutions.—(Complete Specification.) E. Andreoli. 20,401. December 13.

New Companies.

Avon Indiarubber Company, Limited.—This company was registered on the 15th Inst., with a capital of £50,000., in £5. shares, whereof 5,000 are 6 per cent. cumulative preference shares, to acquire the business of india-rubber manufacturers, carried on by E. G. W. Browne and J. C. Margetson at Melksham, Wilts, under the style of the Avon Indiarubber Company. The subscribers are:— Shares.

J. Berry White, Corn-street, Bristol, banker	1
J. C. Margetson, Melksham, indiarubber manufacturer	1
E. G. Browne, Melksham, indiarubber manufacturer	1
T. W. Jacques. Corn-street, Bristol, solicitor	1
R. Blunt, Glebe-place, Chelsea	1
W. G. Cheese, Corporation-street, Birmingham, iron merchant	1
A. G Smith, Melksham solicitor	1

Lactite, Limited.—This company was registered on the 13th inst., with a capital of £30,000., in £1. shares, to manufacture a new material, being a substitute for bone or celluloid. An unregistered agreement of the 17th ult., between W. M. C. Callender, will be adopted. The subscribers are:— Shares.

A. Hailwood, Broughton, Manchester, creamery proprietor	1
J. Collins, 76, King-street, Manchester, manufacturing stationer	1
J. J. Alexander, 76, King-street, Manchester, manufacturing stationer	1
A. Kingston, Longford-place, Victoria-park, Manchester, manufacturer	1
J. B. Dowdall, 1, Hanging-ditch, Manchester, butter merchant	1
E. W. Cowan, Chester, engineer	1
C. E. Knowles, Glossop, electrical engineer	1

Practical Electro-Plating and Enamelling Company, Limited.—This company was registered on the 15th inst., with a capital of £2,000., in £5. shares, to acquire the business carried on by the Practical Electro-Plating and Enamelling Company at Warwick-lane, Coventry. The subscribers are:— Shares.

J. W. Wollington, Coventry, plater, &c.	1
A. M. Barker, Coventry, plater, &c.	1
G. Streetly, Coventry, solicitor	1
J. Mirfield, Coventry, licensed victualler	1
J. O. Asquith, C.A., Coventry	1
A. E. Dyer, Coventry, auctioneer	1
T. B. Heath, Knowle, farmer	1
C. West, Coventry, confectioner	1
A. E. Wildigg, Coventry, engineer	1
J. Plummer, Leamington Spa, plater, &c.	1

South Darren, Limited.—This company was registerd on the 12th inst., with a capital of £15,000., divided into 60,000 shares of 5s. each, to acquire the undertaking and assets of the South Darren Silver Lead Company, Limited, situate in the parish of Llanbadarnfawr, Cardigan. The subscribers are:— Shares.

C. H. Smith, 6a, Austin-friars, secretary to a company	1
G. W. Ritchie, Larkhall-rise, Clapham, secretary	1
J. H. A. Smith, 6a, Austin-friars	1
Hy. Verden, 14, Great Winchester-street, solicitor	1
A. W. Kerly, 14, Great Winchester-street, solicitor	1
T. Norman Bush, 14, Wormwood-street, surveyor	1
Alex. Kerly, 14, Great Winchester-street, solicitor	1

Gazette Notices.

PARTNERSHIPS DISSOLVED.

J. G. Wallbridge and R. Large, under the style of J. G. Wallbridge and Co. Stalybridge, chemists and druggists.
King and Smith, Stowe Works, near Weedon and Haymarket, London, S.W., brick and tile manufacturers, and lime and limestone merchants.
H. Bouttell and H. Hutton, under the style of Tylee and Co., Bath, chemists aud druggists.
Jagger, Son, and Turley, Leeds, patentees of the carbonised refuse system of sewage purification, as far as regards A. C. Turley.
G. Rooke, J. Rooke, and J. A. Rooke, under the style of J. and J. Rooke and Co., Manchester, chemical manufacturers.
J. Bennett and A. E. Bennett, under the style of Bennett and Co., Liverpool, oil and general merchants.
C. Tennant and Partners (Limited) and the Jarrow Chemical Co. (Limited), Haverton Hill, Durham, saltmasters and chemical manufacturers.

THE BANKRUPTCY ACT, 1883.

Adjudications.

Naylor, William Henry, Louth, aerated water manufacturer.

Receiving Orders.

Light, Henry, Lambeth Walk, Lambeth, London, oil and colourman.
Grainger, James, Ryde, ironmonger and oil and colour merchant.
Lycett, Ernest Forrest, East Greenwich, crucible manufacturer.

PRICES CURRENT. WEDNESDAY, DECEMBER 24, 1890.

PREPARED BY HIGGINBOTTOM AND CO., 116, PORTLAND STREET, MANCHESTER.

The values stated are F.O.R. at maker's works, or at usual ports of shipment in U.K. The price in different localities may vary.

	£	s.	d.
Acids:—			
Acetic, 25 % and 40 % .. .. per cwt.	7/- & 11/6		
,, Glacial .. .. ,,	55/-		
Arsenic, S.G., 2000° .. .. ,,	0	12	9
Chromic 82 % .. .. nett per lb.	0	0	6½
Fluoric .. .. ,,	0	0	3¾
Muriatic (Tower Salts), 30° Tw. .. .. .. per bottle	0	0	9
,, (Cylinder), 30° Tw. .. .. ,,	0	3	0
Nitric 80° Tw. .. .. per lb.	0	0	2
Nitrous .. .. ,,	0	0	1¾
Oxalic .. .. nett ,,	0	0	3⅝
Picric .. .. ,,	0	0	11½
Sulphuric (fuming 50 %) .. .. per ton	15	10	0
,, (monohydrate) .. .. ,,	5	10	0
,, (Pyrites, 168°) .. .. ,,	3	2	6
,, (,, 150°) .. .. ,,	1	7	6
,, (free from arsenic, 140/145°) .. .. .. ,,	1	15	0
Sulphurous (solution) .. .. ,,	2	15	0
Tannic (pure) .. .. per lb.	0	1	1½
Tartaric .. .. ,,	0	1	2¾
Arsenic, white powdered .. .. nett per ton	13	10	0
Alum (loose lump) .. .. ,,	5	5	0
Alumina Sulphate (pure) .. .. ,,	5	0	0
,, ,, (medium qualities) .. .. .. ,,	4	12	6
Aluminium .. .. per lb.	0	15	0
Ammonia, ·880 = 28° .. .. per lb.	0	0	3
,, = 24° .. .. ,,	0	0	1¾
,, Carbonate .. .. nett ,,	0	0	3½
,, Muriate .. .. per ton	22	10	0
,, ,, (sal-ammoniac) 1st & 2nd .. per cwt.	37/- & 35/-		
,, Nitrate .. .. per ton	40	0	0
,, Phosphate .. .. per lb.	0	0	10½
,, Sulphate (grey), London .. .. .. per ton	10	12	6
,, ,, (grey), Hull .. .. ,,	10	12	6
Aniline Oil (pure) .. .. per lb.	0	1	1
Aniline Salt ,, ... ,,	0	0	11½
Antimony .. .. per ton	75	0	0
,, (tartar emetic) .. .. per lb.	0	1	0
,, (golden sulphide) .. .. ,,	0	0	10
Barium Chloride .. .. per ton	8	5	0
,, Carbonate (native) .. .. ,,	3	10	0
,, Sulphate (native levigated) .. .. .. ,,	45/- to 75/-		
Bleaching Powder, 35 % .. .. ,,	6	12	6
,, Liquor, 7 % .. .. ,,	2	10	0
Bisulphide of Carbon .. .. ,,	12	0	0
Chromium Acetate (crystal .. .. per lb.	0	0	6
Calcium Chloride .. .. per ton	2	5	0
China Clay (at Runcorn) in bulk .. .. .. ,,	17/6 to 35/-		
Coal Tar Dyes:—			
Alizarine (artificial) 20 % .. .. per lb.	0	0	9
Magenta .. .. ,,	0	3	9
Coal Tar Products			
Anthracene, 30 % A, f.o.b. London .. per unit per cwt.	0	1	5
Benzol, 90 % nominal .. .. .. per gallon	0	4	8
,, 50/90 ,, ... ,,	0	3	8
Carbolic Acid (crystallised 35°) .. .. .. per lb.	0	0	5¾
,, (crude 60°) .. .. per gallon	0	1	6
Creosote (ordinary) .. .. ,,	0	0	3½
,, (filtered for Lucigen light) .. .. ,,	0	0	4
Crude Naphtha 30 % @ 120° C. .. .. .. ,,	0	1	11
Grease Oils, 22° Tw. .. .. per ton	3	0	0
Pitch, f.o.b. Liverpool or Garston .. .. .. ,,	1	16	0
Solvent Naphtha, 90 % at 160° .. .. .. per gallon	0	1	11
Coke-oven Oils (crude) .. .. ,,	0	0	2
Copper (Chili Bars) .. .. per ton	54	0	0
,, Sulphate .. .. ,,	19	0	0
,, Oxide (copper scales) .. .. ,,	52	0	0
Glycerine (crude) .. .. ,,	30	0	0
,, (distilled S.G. 1250°) .. .. ,,	60	0	0
Iodine .. .. nett, per oz.	0	0	9
Iron Sulphate (copperas) .. .. per ton	1	12	6
,, Sulphide (antimony slag) .. .. ,,	2	0	0
Lead (sheet) for cash .. .. ,,	14	0	0
,, Litharge Flake (ex ship) .. .. ,,	15	15	0
,, Acetate (white ,,) .. .. ,,	24	0	0
,, ,, (brown ,,) .. .. ,,	18	10	0
,, Carbonate (white lead) pure .. .. .. ,,	20	0	0
Nitrate .. .. ,,	21	10	0
Lime, Acetate (brown) .. .. ,,	7	15	0
,, ,, (grey) .. .. per ton	12	15	0
Magnesium (ribbon and wire) .. .. per oz.	0	2	3
,, Chloride (ex ship) .. .. per ton	2	5	0
,, Carbonate .. .. per cwt.	1	17	6
,, Hydrate .. .. ,,	0	10	0
,, Sulphate (Epsom Salts) .. .. .. per ton	3	0	0
Manganese, Sulphate .. .. ,,	17	0	0
,, Borate (1st and 2nd) .. .. per cwt.	60/- & 42/6		
,, Ore, 70 % .. .. per ton	4	10	0
Methylated Spirit, 61° O.P. .. .. per gallon	0	2	6
Naphtha (Wood), Solvent .. .. ,,	0	4	3
,, ,, Miscible, 60° O.P. .. .. .. ,,	0	4	8
Oils:—			
Cotton-seed .. .. per ton	18	15	0
Linseed .. .. ,,	22	10	0
Lubricating, Scotch, 890°—895° .. .. .. ,,	7	5	0
Petroleum, Russian .. .. per gallon	0	0	5⅜
,, American .. .. ,,	0	0	5¼
Potassium (metal) .. .. per oz.	0	3	10
,, Bichromate .. .. per lb.	0	0	3¾
,, Carbonate, 90% (ex ship) .. .. .. per ton	19	15	0
,, Chlorate .. .. per lb.	0	0	5½
,, Cyanide, 98% .. .. ,,	0	2	2
,, Hydrate (Caustic Potash) 80/85 % .. per ton	23	10	0
,, ,, (Caustic Potash) 75/80 % .. ,,	22	10	0
,, ,, (Caustic Potash) 70/75 % .. ,,	21	15	0
,, Nitrate (refined) .. .. per cwt.	1	2	6
,, Permanganate .. .. per cwt.	£3 5 0 to 3	10	0
,, Prussiate Yellow .. .. per lb.	0	0	10
,, Sulphate, 90 % .. .. per ton	9	15	0
,, Muriate, 80 % .. .. ,,	8	0	0
Silver (metal) .. .. per oz.	0	4	1⅛
,, Nitrate .. .. ,,	0	2	10
Sodium (metal) .. .. per lb.	0	4	0
,, Carb. (refined Soda-ash) 48 % .. .. per ton	6	2	6
,, ,, (Caustic Soda-ash) 48 % .. .. ,,	5	5	0
,, ,, (Carb. Soda-ash) 48% .. .. .. ,,	5	10	0
,, ,, (Carb. Soda-ash) 58 % .. .. .. ,,	6	10	0
,, ,, (Soda Crystals) .. .. ,,	3	5	0
,, Acetate (ex-ship) .. .. ,,	17	0	0
,, Arseniate, 45 % .. .. ,,	11	0	0
,, Chlorate .. .. per lb.	0	0	6¾
,, Borate (Borax) .. .. nett, per ton.	29	0	0
,, Bichromate .. .. per lb.	0	0	2¾
,, Hydrate (77 % Caustic Soda) (f.o.b.) per ton.	13	10	0
,, ,, (74 % Caustic Soda) ,, .. ,,	12	5	0
,, ,, (70 % Caustic Soda) ,, .. ,,	11	5	0
,, ,, (60 % Caustic Soda) .. .. ,,	10	5	0
,, ,, (60 % Caustic Soda, cream) (f.o.b.) ,,	9	15	0
,, Bicarbonate .. .. ,,	8	0	0
,, Hyposulphite .. .. ,,	5	10	0
,, Manganate, 25% .. .. ,,	9	0	0
,, Nitrate (95 %) ex-ship Liverpool .. .. per cwt.	0	7	7½
,, Nitrite, 98 % .. .. per ton	28	10	0
,, Phosphate .. .. ,,	16	0	0
,, Prussiate .. .. per lb.	0	0	7¾
,, Silicate (glass) .. .. per ton	5	7	6
,, ,, (liquid, 100° Tw.) .. .. .. ,,	4	0	0
,, Stannate, 40 % .. .. per cwt.	2	10	0
,, Sulphate (Salt-cake) .. .. per ton.	2	0	0
,, ,, (Glauber's Salts) .. .. ,,	1	10	0
,, Sulphide .. .. ,,	7	15	0
,, Sulphite .. .. ,,	6	5	0
Strontium Hydrate, 98 % .. .. ,,	8	0	0
Sulphocyanide Ammonium, 95 % .. .. per lb.	0	0	8½
,, Barium, 95 % .. .. ,,	0	0	5¾
,, Potassium .. .. ,,	0	0	8½
Sulphur (Flowers) .. .. per ton.	9	0	0
,, (Roll Brimstone) .. .. ,,	6	5	0
,, Brimstone: Best Quality .. .. ,,	4	15	0
Superphosphate of Lime (26 %) .. .. ,,	2	12	6
Tallow .. .. ,,	27	10	0
Tin (English Ingots) .. .. ,,	96	0	0
,, Crystals .. .. per lb.	0	0	6¾
Zinc (Spelter) .. .. per ton.	23	10	0
,, Chloride (solution, 96° Tw. .. .. ,,	6	10	0

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TIPTON GAS WORKS.

COAL CONTRACTS.

THE Gas Committee of the Tipton Local Board invite TENDERS for the supply of GAS COAL, for a period of one, two, or three years, from the 1st September next, in annual quantities of about 9,000 tons, to be delivered carriage free, to the Gas Works Sidings (L. & N. W. Rly. Co.).

Specification and form of Tender may be obtained at the Gas Works, on application to Mr. VINCENT HUGHES, the Engineer and Manager.

Sealed and endorsed Tenders to be sent to me, the undersigned, not later than 10 a.m., on Monday, 25th instant.

The Committee do not bind themselves to accept the lowest or any tender.

By Order,
GEO. M. WARING,
Clerk to the Board.

Tipton,
8th August, 1890.

COUNTY BOROUGH OF SALFORD.

GAS DEPARTMENT.

SPENT OXIDE.

THE Gas Committe invite Tenders for the purchase of about 850 tons of SPENT OXIDE.

Further particulars and forms of Tender may be obtained from the Gas Engineer, Gas Offices, Bloom-street, Salford.

Sealed Tenders, endorsed "Spent Oxide," to be sent to me not later than Five p.m., on Thursday, the 21st of August next.

By Order,
SAMUEL BROWN,
Town Clerk.

Town Hall, Salford,
Aug. 7th, 1890.

Miscellaneous.

☞ **Replies to Advertisements addressed to the "Chemical Trade Journal" office are forwarded to Advertisers, post free, on the day of their receipt.**

HOFFMANN'S GAS COMBUSTION FURNACE for Sale; size 26 inch, with 26 stopcocks and three rows of burners; suitable for Organic Analysis, Tube Experiments, &c.—Offers to H 300, *Chemical Trade Journal* Office, Blackfriars-street, Manchester.

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AS Manager, or Foreman, of Tar, Naphtha, Ammonia, &c., Works; advertiser has had extensive experience in the above trades and management of men.—"Chemist," *Chemical Trade Journal*, Blackfriars-street, Manchester.

Miscellaneous.

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STEAM CRANE.—One 3 ton Loco. Steam Crane, by Appleby, wood jib about 30ft. long, with 3 tons rails; £160.—LA, 303, *Chemical Trade Journal* Office.

STEAM DERRICK CRANE.—One 2 ton Steam Derrick Crane, with 40ft. jib, 120ft. steel wire rope, all complete and in good order; £90.—LB, 304, *Chemical Trade Journal* Office.

TRAVELLING CRANE.—One nearly new, hand Travelling Crane, 4' 8½" gauge, 11ft. radius by Smith; £50.—LC, 305, *Chemical Trade Journal* Office.

HAND WINCH.—One strong Hand Winch with barrel 2ft. by 7in.; as good as new; £5.—LD, 306, *Chemical Trade Journal* Office.

ONE SINGLE PURCHASE CRAB.—In good order; £2.—LE, 307, *Chemical Trade Journal* Office.

LIFTING JACK.—To lift four tons; £1 10s.—L308, *Chemical Trade Journal* Office.

PORTABLE ENGINE.—One 18 H.P. Portable Engine, by Clayton & Shuttleworth; sound fire box; cylinders re-bored and new pistons; £82.—L309, *Chemical Trade Journal* Office.

STEAM ENGINE, 18 H.P., by Garrett; in good working order; £38.—L310, *Chemical Trade Journal* Office.

CONTRACTOR'S LOCOMOTIVE. —One 12 H.P. Contractor's Locomotive, by Chaplin & Co., Glasgow; four wheels. 4ft. 8½in. gauge; £190.—L311, *Chemical Trade Journal* Office.

STONE BREAKER.—One "Simplex" Stone Breaker, 12in. by 7in., very little used; £35.—L312, *Chemical Trade Journal* Office.

PULSOMETER.—One No. 5 Pulsometer, with foot valve, vertical cross tube boiler fitted with injector, 30ft. of steam pipe, four bends, suction and delivery pipe and clip connections; only worked 14 weeks; £85.—L313, *Chemical Trade Journal* Office.

COMPRESSOR.—One Air Pump Compressor, with steam cylinder, fly wheel, and crank shaft; £56.—L314, *Chemical Trade Journal* Office.

CENTRIFUGAL PUMP.—One three-inch Centrifugal Pump and foot valve complete; equal to new; £6.—L315, *Chemical Trade Journal* Office.

OLD RAILS.—A quantity for disposal; 28lbs. per yard; £6 5s. per ton.—F1, *Chemical Trade Journal* Office.

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VERTICAL BOILER.—One Vertical Boiler, 1ft. 8in. by 3ft. 6in., in good sound condition; £30.—Apply to A47, *Chemical Trade Journal* office.

VERTICAL BOILER.—One Vertical Boiler, 2ft. 7in. by 3ft. 3in.; sound; £25.—Apply A48, *Chemical Trade Journal* Office.

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MORTAR MILL.—One Under-geared Mortar Mill, with 4ft. pan; in good working order; £20.—A400, *Chemical Trade Journal* Office.

MORTAR MILL.—One Mill in good condition, with 5ft. pan; under-geared; £25.—A401, *Chemical Trade Journal* Office.

MORTAR MILL.—One Mortar Mill, with 6-ft. pan; under-geared; £30.—A403, *Chemical Trade Journal* Office.

MORTAR MILL.—One Mortar Mill, with 7ft. pan, in good working order; price £50.—Address A404, *Chemical Trade Journal* Office.

MORTAR MILL.—One 8ft. Mortar Mill; £75; or may be had with portable engine at moderate price extra.—A405, *Chemical Trade Journal* Office.

ENGINE AND BOILER.—One 12 H.P. combined Engine and Boiler, by Rushton & Proctor; cylinder 8½in. by 12in.; boiler 9ft. 9in. by 4ft., with four tubes; in excellent working condition; £190.—Address 32, *Chemical Trade Journal* Office.

ENGINE.—One 24in. by 48in. horizontal Engine, by Musgrave; in excellent working condition; price £260.—Apply to A33, *Chemical Trade Journal* Office.

ENGINE.—One 28in. by 60in. horizontal Steam Engine, by Wood; has been carefully overhauled by a good engineer; price £265.—Address B33, *Chemical Trade Journal* Office.

HORIZONTAL STEAM ENGINE —One Steam Engine in good working condition, nearly new; cylinder 18in. diameter, 36in. stroke; price £260.—Apply C33, *Chemical Trade Journal* Office.

STEAM ENGINE.—One horizontal Steam Engine, nearly new; cylinder 12½in. by 30in.; price £100.—Address D33, *Chemical Trade Journal* Office.

HORIZONTAL STEAM ENGINE —One 25 H.P. Horizontal Steam Engine, 15in. by 30in.; slide valve arranged to cut off at half-stroke; by Marshall; fly wheel 9ft. 6in. diameter; high speed governor; this is a massive engine and has only done two years' work; price £170.—Apply F33, *Chemical Trade Journal* Office.

WANTED.—Second-hand Boiler, Galloway, 30' by 7', to work at 80lbs.; state lowest price.—Address *Chemical Trade Journal*.

BOILERS WANTED.—Two Lancashire Boilers, 30' by 7' 6", to work at 85lbs.; state where to be seen and lowest cash price.—Address *Chemical Trade Journal*.

PAIR HORIZONTAL ENGINES. —Wanted, a pair Horizontal Engines, 20" to 24" cylinders, and 48" to 60" stroke; give name of makers, with lowest price, and state where to be seen.—Address *Chemical Trade Journal*.

GRINDSTONE, 48" by 8", hung on wrought iron spindle, with washer plates, and tightening nuts, gun metal bearings, fast and loose pulleys, and striking gear cast iron trough with rest, and fitted with Water of Ayr stone; £11 10s.—Address *Chemical Trade Journal*.

CAVITY PAN.—One Cased Pan 3' 3" by 3', d/d Salford; price £9.—Address *Chemical Trade Journal*.

PULLEY.—One 30" by 5" pulley, price 16s. net; one 42" by 4" pulley, £1 1s.—Address *Chemical Trade Journal*.

CEMENT TESTER.—One Michalle's Tester, with two Briquette moulds and stands; price £12 10s.—Address *Chemical Trade Journal*.

GRINDSTONE.—Wanted, one Grindstone for steel and engineering works; to be 48" by 12"; fitted with spindle, cast iron trough and rest; state price d/d Rochdale.—Address *Chemical Trade Journal*.

VERTICAL ENGINE.—Wanted, one 8-H.P. Vertical Engine; must be by good maker, and nearly new; state price d/d Halifax.—Address *Chemical Trade Journal*.

GAS ENGINE.—3½ or 4 H.P. Gas Engine, must be in good order; state makers name and price, and where to be seen.—Address *Chemical Trade Journal*.

LANCASHIRE BOILER.—30ft. by 7ft., two flues 2' 9", recently working at 85lbs., with first-class mountings and fittings; nearly good as new; made by Oldham Boiler Co.; Price, F.O.R., Manchester, £275 net.—Address A34, *Chemical Trade Journal*.

LANCASHIRE BOILER.—34ft. by 7ft., to work at 60lbs.; lying at Wigan; two flues 2' 9" diam.; price £170.—Address A35, *Chemical Trade Journal*.

LANCASHIRE BOILER.—30ft. by 7ft., to work at 70lbs.; lying near Gloucester; two flues 2' 8" diam.; price £165.—Address A36, *Chemical Trade Journal*.

LANCASHIRE BOILER.—21ft. by 7ft.; two flues 24"; plates ½"; nearly new; lying at Halifax; price £85.—Address A37, *Chemical Trade Journal*.

CORNISH BOILER.—16½ft. by 5½ft, with 2' 6" dome, fire door, all complete; lying at Soho; price £68.—Address A38, *Chemical Trade Journal*.

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CORNISH BOILER.—11ft. by 4ft., flue 24", dome 20"; work at 60lbs.; fittings, &c.; price £48. F.O.R. Birmingham.—Address A43, *Chemical Trade Journal*.

VERTICAL BOILER.—9ft. by 3ft. 6in., well made for high pressure; price £40. F.O.R. Brighouse.—Address A44, *Chemical Trade Journal*.

VERTICAL BOILER.—New, 7ft. 3in. by 3ft. 3in., with two cross tubes; price £42. F.O.R. Salford.—Address A45, *Chemical Trade Journal*.

VERTICAL BOILER.—New, 6ft. by 2ft. 6in., with cross tube; work at 70lbs; price £26. F.O.R. Salford.—Address A46, *Chemical Trade Journal*.

VERTICAL BOILER.—New, 5ft. by 2ft. 6in., with cross tubes, with mountings and fittings; price £21. F.O.R. Salford.—Address A47, *Chemical Trade Journal*.

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Tenders.

TO TAR DISTILLERS AND OTHERS.

THE Directors of the Gloucester Gas-light Company invite Tenders for the surplus TAR produced at their works for one, two, or three years, from the 1st day of October next.

The Tar will be delivered into Boats or Barges at the Company's Wharf, on the Gloucester and Berkeley Canal.

Offers to be at per ton of 200 gallons.

Payments, cash monthly.

Further particulars may be obtained on application to Mr. R. Morland, the Company's Engineer.

Sealed Tenders, endorsed "Tender for Tar," and addressed to the Chairman, Gas Offices, Quay, Gloucester, to be delivered not later than Tuesday, the 26th day of August instant.

The Directors do not bind themselves to accept the highest or any tender.

By Order,
WILLIAM E. VINSON,
Gas Offices, Gloucester, Secretary.
August 7th, 1890.

TO TAR DISTILLERS, ETC.

THE Directors of the Sheffield United Gaslight Company, are prepared to receive Tenders for the purchase of the surplus TAR made at their Neepsend and Effingham Street Works, for the period of Twelve months ending August 31st, 1891.

The quantities will be approximately: Neepsend, 6,500 tons; Effingham Street, 1,500 tons.

At Neepsend the tar will be loaded into tanks on the Company's Siding, on the Manchester, Sheffield and Lincolnshire Railway, or into Barrel Carts on the works; and at Effingham Street into Barrel Carts only.

Forms of Tender and conditions of contract may be obtained from the undersigned, to whom Tenders, endorsed "Tender for Tar," must be delivered on or before Wednesday, September 3rd.

The Directors do not bind themselves to accept the highest or any tender.

HANBURY THOMAS,
General Manager.
Commercial Street, Sheffield,
August 16th, 1890.

TENDERS FOR TAR.

THE Directors of the Exeter Gas-light and Coke Company invite Tenders for their surplus TAR for one year from the 14th day of October next.

Delivery on Company's Works, filled into purchaser's Tanks.

Payments, cash monthly.

Sealed Tenders, endorsed "Tender for Tar," will be received by the undersigned, on or before Friday, the 19th day of September next; but the Directors do not bind themselves to accept the highest or any tender.

By Order,
W. A. PADFIELD,
Gas Offices, Secretary and Manager.
248, High-street, Exeter,
August 6th, 1890.

SALE OF GAS TAR and AMMONIACAL LIQUOR AT THE ROYAL ARSENAL, WOOLWICH.

THE Secretary of State for War is prepared to receive Tenders for the purchase of such quantities of GAS TAR and AMMONIACAL LIQUOR as may be for disposal during a period of three years from the 1st October, 1890, at the Royal Arsenal, Woolwich, where forms of Tender and all information may be obtained, on application to the Director General of Ordnance Factories.

The Tenders are to be delivered at the War Office, Pall Mall, S.W., by 12 o'clock noon, on Friday, the 5th day of September, 1890, addressed to the Director of Army Contracts, and marked on the outside "Tender for the purchase of Gas Tar, &c.

EVAN COLVILLE NEPEAN,
Director of Army Contracts.
War Office, Pall Mall, S.W.,
August 14th, 1890.

GAS TAR.

THE Widnes Local Board invite Tenders for the purchase of about 650 tons of GAS TAR from their Gas Works, for the twelve months ending September 30th, 1891.

Form of Tender and conditions of contract may be obtained from Mr. Carr, Gas Works, Widnes.

Tenders, endorsed "Tar," to be delivered to the undersigned, not later than the 30th instant.

The Board do not bind themselves to accept the highest or any tender.

JAS. T. ALLEN,
Clerk.
Town Hall, Widnes,
Aug. 13th, 1890.

Miscellaneous.

COPPER WATER OVEN with special fittings for utilizing steam, £3 nett, a bargain; set of brass weights, 1000 grains to 1-100 grain, with riders, in polished mahogany case, cost 35s., price 15s.; pair Allen's Nitrometer tubes, 5s.; 7,60cc. burette Mohr's pinchcock, 3s.; one do. glass stopcock, 4s.; one glass reflecting prism, 1¼in. faces, 2s. 6d.; one 1⅜in. rhomb of Iceland Spar, double refracting, 2s. 6d.—L152, *Chemical Trade Journal* Office, Blackfriars-street, Manchester.

CORUNDUM ALUMINIUM.—For Sale by private contract, East India Corundum, analysing 68 per cent. of Alumina, suitable for the manufacture of Aluminium.—Address Richard Baker, Raw Produce Agent, 6 and 7, Cross lane, Eastcheap, London.

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ALKALI Works Chemist, many years' experience; would engage with a good firm as manager, chemist or engineer; thoroughly acquainted with all the latest improvements, and not afraid of spending either time or trouble to ensure success; strictest confidence observed and expected.—Please address XL, *Chemical Trade Journal* Office.

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THE Directors of the above Company invite Tenders for the supply of SULPHURIC ACID (B.O.V.) 150° Twaddle, to be delivered by road, rail, or canal, at the Company's Sulphate works, Shrewsbury, during the twelve months from the 29th of September, 1890.

The Acid to be free from dirt; to produce clean white Sulphate; and to be delivered in carboys at such times and in such quantities as may be required by the Company's Manager.

About 100 tons will be required under the contract.

Terms: Monthly, less 2½ per cent.

The Directors do not bind themselves to accept the lowest or any tender.

Tenders to be sent to the undersigned on or before September 22nd, 1890.

By order,
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Gas Works, Shrewsbury, Aug. 27, 1890.

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Miscellaneous.

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Gas Works, Shrewsbury, Aug. 27, 1890.

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By order,
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Secretary and Manager.

Gas Works, Shrewsbury, Aug. 27, 1890.

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Stapleton.....550,000 ,,

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JAS. V. GREEN,
Secretary.

Gas Light Offices,
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10th September, 1890.

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THE Stretford Gas Company are prepared to receive TENDERS for the GAS TAR and AMMONIACAL LIQUOR produced at their works (together or seperately) for a period of one year, commencing November 1st next.

Tenders to be sent in and addressed to the Chairman, and endorsed "Tender for Tar, &c.," on or before Monday, October 6th, 1890.

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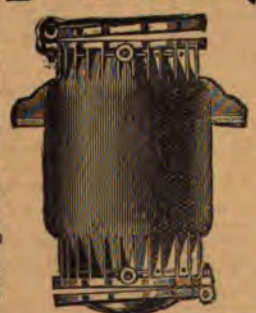

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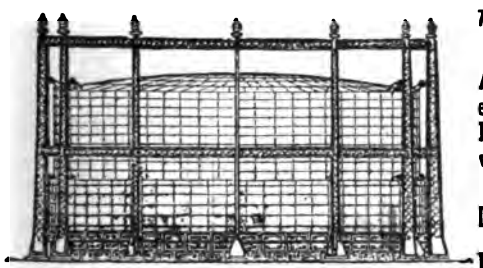

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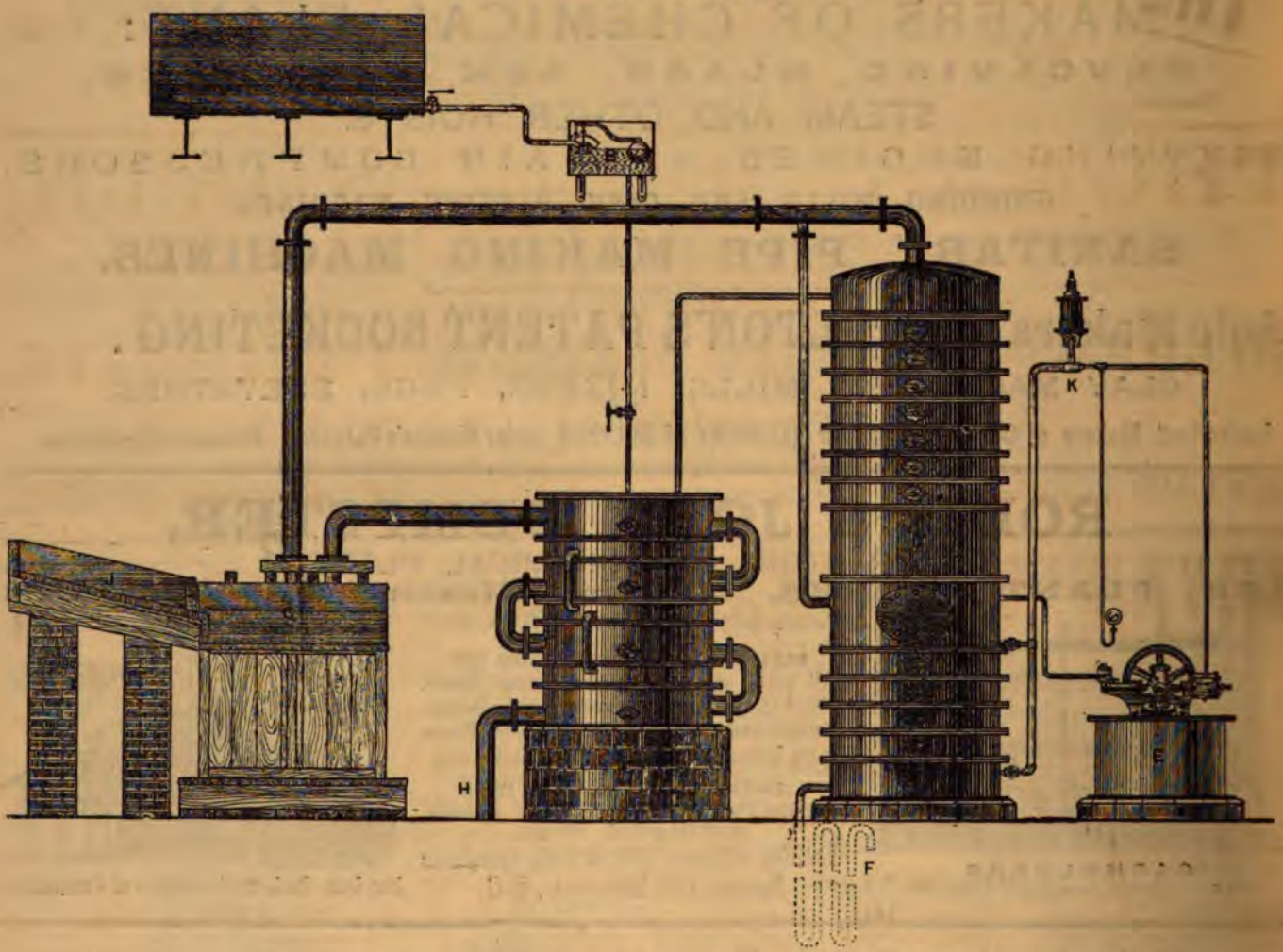

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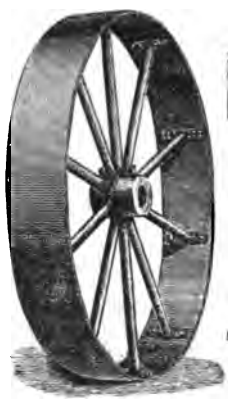

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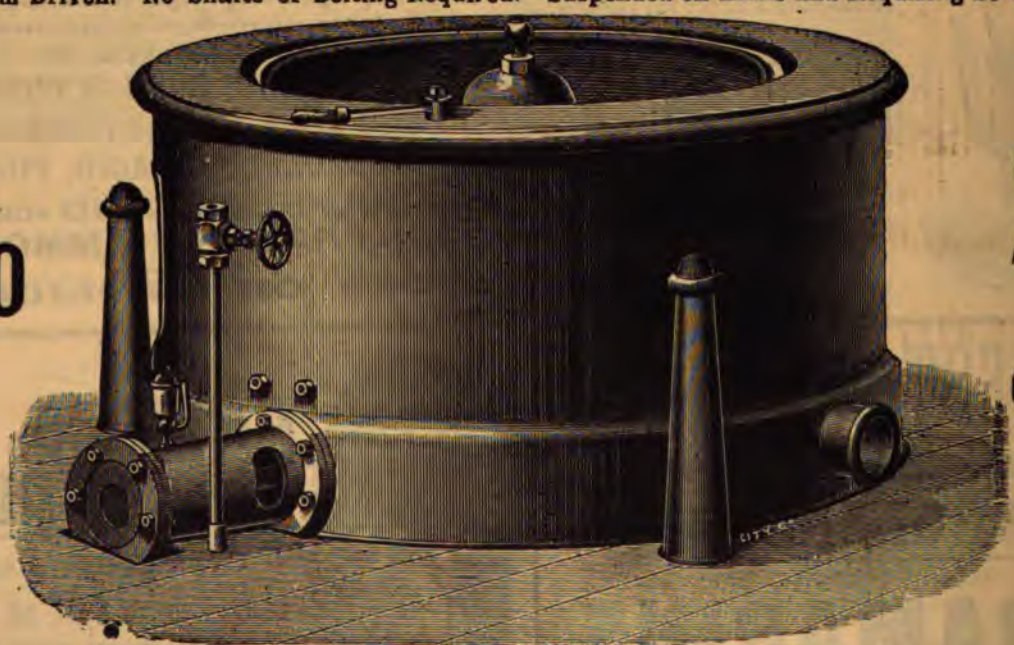

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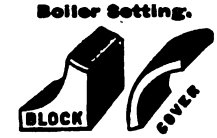

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Air Compressors—
Daglish, R. & Co., St. Helens, Lancashire.—*See Advt.*
Meldrum Bros., 24, Cathedral Yard, Manchester.
Neill, W. & Son, St. Helens.
Scott, Geo. & Son, 44, Christian-st., London, E.
Walker Bros., Pagefield Ironworks, Wigan.

Air Propellers—
Blackman Air Propeller Ventilating Co., Ltd., 63, Fore Street, London, E.C.—*See Advt.*

Albumen—
Smith & Forrest Holt Town, Manchester.—*See Advt.*
The Animal Products Co., Ltd., Benson Street, Liverpool—*See Advt.*

Alkali—
Brunner, Mond & Co., Limited, Northwich.—*See Adv.*
J. Haddock & Co , C 16, Exchange Buildings, Liverpool.—*See Advt.*
Newcastle Chemical Works Co. Ltd., Newcastle-on-Tyne

Alum and Sulphate of Alumina—
Glasgow Alum and Ammonia Co., Ltd., 401, West Street, Glasgow.
Julius Hülsen & Co., Newcastle-on-Tyne.—*See Advt.*
Spence, Peter & Sons, Manchester Alum Works.—*See Ad*

Aluminium and Aluminium Alloys—

Ammonia (·880) Manufacturers—
Brotherton & Co., Commercial Buildings, Leeds.

Aniline Colours—
[don, E.—*See Advt.*
Brooke, Simpson & Spiller, Ltd., Hackney Wick, Lon-
Thomas & Dower, Ltd., Garratt-lane, Tooting, London.

Assayers and Analysts—
Beringer, C. & J. J., Reduth and Camborne.
Davis, Bros., 32, Blackfriars-st. Manchester.—*See Advt.*
Dr. P. Norman Evans, F.C.S., 28, Great Ormond Street, London, W C.—*See Advt.*
Stewart, G. Combe, F.C.S., 33, Elmfoot St., Glasgow.

Barium Salts—
Julius Hülsen & Co., Newcastle-on-Tyne.—*See Advt.*

Bauxite—
Haddock, J. & Co., Exchange-buildings L'pool.—*See Ad.*

Belting—
Greenwood, J. & Co., Ltd., Todmorden.
Rossendale Belting Co., Manchester.
Reddaway, F. & Co., Pendleton.

Bisulphide of Carbon—
Arnott, G. W., & Co , 21, Lime St., London, E.C.—*See Ad.*
Button, H. & Co., Faraday Chemical Works, Rainham, Essex.—*See Advt.*
Smith Alfred, Clayton, near Manchester.—*See Advt.*

Bisulphite of Lime—
Bennett & Jenner, Stratford, London.
Boake, Roberts & Co., Stratford, London, E.—*See Advt.*
Keys, Samuel & Co., Ltd., West Bromwich.—*See Advt.*

Boiler Composition—
Aston Chemical Co., Birmingham.—*See Advt.*

Boracic Acid—
Townsend, Jos., Limited, Glasgow.

Borax—
Townsend, Jos., Limited, Glasgow.

Brick and Tile Manufacturers—
Buckley Brick and Tile Co., Ltd., Buckley, nr Chester.
Cliff, J., & Sons, Royal Exchange, Leeds.

Caramel (Liquid or Solid)—
Bennett & Jenner, Stratford, London.
Boake, Roberts & Co., Stratford, London, E.—*See Advt*

Carboys (Glass)—
Cannington, Shaw & Co., St. Helens.—*See Advt.*

Carboy Hampers (Iron)—
Marple Chemical Co., Marple, near Stockport.

Cement (Portland) Manufacturers—
Brotherton & Co., Commercial Buildings, Leed .

Charcoal—
Lydbrook Chemical Co. 143, Cannon-st., E.C.—*See Advt.*

Chemical Balances—
Griffin, John J. & Sons, 22, Garrick-st , Covent Garden, London.
Mawson & Swan, Mosley-st., Newcastle-on-Tyne.—*See Ad.*

Chemical and Scientific Bookseller—
Bell, Geo. & Son, 4 & 5, York Street, Covent Garden London, W.C.—*See Advt.*
Churchill, J. & A., 11, New Burlington St., London.
Clay, W. F., 2, Teviot Place, Edinburgh.
Gurney & Jackson, 1, Paternoster Row, London, E.C.

Chemical Engineers—
Davis Bros., 32, Blackfriars-st., Manchester.—*See Ad.*

Chemical Merchants, Brokers & Agents—
Bradbury & Hirsch, 28, Exchange-st. East, Liverpool.
Haddock, J. & Co., Exchange-buildings, L'pool.—*See Ad.*
Higginbottom & Co., 116, Portland-street, Manchester.
Jackson, G B., 6, Booth-street, Piccadilly, Manchester.
[illegible] Co., Newcastle-on-Tyne.—*See Advt.*

Chemical Plant—
Bailey, W. H., & Co., Limited, Salford.
Bradbury, J., 361, Stretford Road, Manchester —*See Advt.*
Cortin, J., Newcastle-on-Tyne.—*See Advt.*
Daglish, R. & Co., St. Helens.—*See Advt.*
Davis Bros., 32, Blackfriars-st., Manchester.—*See Advt.*
Heyes, W., St. Helens.
Neill, W. & Son, St. Helens —*See Advt.*
Robinson, Cooks & Co., St. Helens.
Rushton & Co., 64, Victoria Street, Liverpool.
Scott, Geo. & Son, 44, Christian-st., London, E.
Widnes Foundry Co., Widnes.

Coils (Tubular)—
Aird, Joseph, Great Bridge, Staffordshire.—*See Advt.*

Dyers' Chemicals—
Hope, A., jun., & Co., Coatbridge-st., Glasgow.

Dyewood Extracts—
Milnes, E. D. & Bro., Lumn Mills near [illegible]ury.

Enamelled Iron Pulleys—
Ruscoe, John, Albion Ironworks, Hyde. *See Advt.*

Filter and Press Cloths—
Stead, J. F., Skinner-lane, Leeds.

Filter-Presses—
Manlove, Alliott & Co., Limited, Nottingham.—*See Advt.*
Neill, W. & Son, St. Helens.—*See Advt.*

Fine Chemicals—
Harrington Bros., Cork (for glass and pottery).
Harris, P. & Co., Limited, Bull Ring, Birmingham.

Fire Bars—
Milson, Arthur, & Co., 28, Lesbia Road, London, N.E —*See Advt.*

Gas Holders—
Dempster, R. & J., Newton Heath, Manchester.

Glass Bottles—
Mottershead & Co., 7, Exchange-street Manchester.

Glue—
Bindley, T. R. B. & Son, Smethwick, nr. Birmingham.
Sheppy Glue and Chemical Works, Ltd , 34, Mark Lane, London.
The Animal Products Co., Ltd., Benson Street, Liverpool—*See Advt.*

Glycerine—
Hazlehurst & Sons, Runcorn.—*See Advt.*

Grinding Machinery—
Corcoran, B., 31, Mark Lane, London.
Follows & Bate, Ltd., Gorton, Manchester.—*See Advt.*

Hydro-Extractors—
Broadbent, T. & Sons, Chapel-hill, Huddersfield.—*See Ad.*
Manlove, Alliott, & Co., Limited, Nottingham.—*See Adv.*

Hyposulphite of Soda—
Richardson, J. G. & W. H., Jarrow-on-Tyne.

Indiarubber Chemicals—
Smith, Alfred, Clayton, near Manchester.—*See Advt.*

Indiarubber Manufacturers—
Moseley, David. & Sons, Ardwick, Manchester.
North British Rubber Co., Limited., Edinburgh.

Isinglass—

Ivory Black—
Hunt, J. T. & Son, Ltd., Stratford, London, E.—*See Adv.*

Laboratory Apparatus—
Griffin, John J. & Sons, 22, Garrick-st. Covent Garden, London.
Harris, P. & Co., Ltd., Bull Ring, Birmingham.
Jackson, Fred. & Co., 10, Half Moon St., Manchester.
Mawson & Swan, Mosley-st., Newcastle-on-Tyne.—*See Ad.*
Woolley, James, Sons, & Co., 69, Market St., Manchester.

Lampblack—
Jas. Drinkwater, Springfield Lane Chemical Works, Salford.

Lead Salts—
Lindsey, C. R. & Co., Clayton, nr. Manchester.—*See Adv.*

Lubricators—
Macdonald, F., & Co., 8a, Lord Street, Liverpool.

Magnesia—
Washington Chemical Co., Washington, Durham.

Mechanical Stokers—
Chadderton Iron Works Co., Ltd , nr Manchester.—*See Ad.*

Meters—

Manganese & Mineral Merchant—
Blackwell, Geo. G., 25-27 Irwell Chrs., Liverpool.—*See Ad.*

Methylated Spirit—

Muriatic Acid—
Howarth & Co., Miles Platting, Manchester.

Nitric Acid—

Oil Filters—
Woodhouse & Rawson, United, Ltd., 88, Queen Victoria Street, London, E.C.

Oil & Tallow Refiners & Merchants—
Smith & Forrest, Holt Town, Manchester.—*See Advt.*
The Animal Products Co., Ltd., Benson Street, Liverpool—*See Advt.*

Oxide of Iron—
Bale, Baker & Co., 120, Newgate Street, London, E.C

Patent Agents—
Chapman, J. C., 70, Chancery Lane, London, W.C.—*See Ad.*
Redfern, G. F. & Co., 4, South-st., Finsbury, E.C.—*See Ad.*
Thompson, W. P., & Co., 6, Lord St., Liverpool.—*See Ad*
Wallace Weatherdon & Co., 57 & 58, Chancery Lane, and 11, Southampton Buildings, London, W.C.

Peroxide of Hydrogen—
Bennett & Jenner, Stratford, London, E.
Thomas & Dower, Ltd., Garratt-lane, Tooting, London.

Phosphate (Precipitated)—
Marple Chemical Co., Marple, near Stockport.

Phosphoric Acid—
Boake, Roberts & Co., Stratford, London, E.—*See Advt.*

Phosphorus Manufacturers—
Coignet & Co., 150, Fenchurch St., London, E.C.

Prepared Horn Piths—
Marple Chemical Co., Marple, near Stockport.

Pulleys—
Richards, Geo., & Co., Limited, Broadheath.

Pumping Machinery—
Bailey, W. H., & Co., Limited, Salford.
Daglish, R., & Co., St. Helens, Lancashire.—*See Advt*
Neill W. & Son, St. Helens.
Pearn, Frank, & Co., West Gorton, Manchester
Pulsometer Engineering Co. Ltd. Nine Elms, S.W

Pyrometers—
Gauntlet, W. H., Middlesbrough.

Rectifying Glass Retorts—
Webb Bros., Varley-street, Oldham-road, Manchester.
Samuel Ralphs, Prussia St., Oldham Rd. Manchester.

Refrigerating Machinery—
Linde's British Refrigeration Co., Ltd., 35, Queen Victoria Street, London, E.C.—*See Advt.*
Neill, W. & Son, St. Helens.—*See Advt.*

Silicate of Soda—
Richardson, J. G. & W. H., Jarrow-on-Tyne.

Smoke Burner—
Greaves, W. McG., Old Street, Ashton-under-Lyne.

Steam Boilers—
Daglish, R., & Co., St. Helens.—*See Advt.*
Galloways Limited, Manchester.

Steam Jet Apparatus—
Meldrum Bros., 24, Cathedral Yard, Manchester

Steam Traps—
Chadderton Iron Works Co., Limited, Chadderton, near Manchester.—*See Advt.*

Sulphate of Ammonia Manufacturers—
Brotherton & Co , Commercial Buildings, Leeds.
Farmer, Thos., & Co., Mark-lane, London, E.C.—*See Ad.*
Hunt, J. T., & Son, Ltd., Stratford, London, E.—*See Ad*
Illingworth, Thos., North Dean, nr. Halifax.—*See Advt.*

Sulphate of Ammonia Plant—
Daglish, R. & Co., St. Helens, Lancashire.—*See Advt.*
Davis, Bros., 32, Blackfriars-st., Manchester.—*See Advt.*
Neill, W. & Son, St. Helens.—*See Advt.*

Sulphate of Copper—
J. Haddock & Co., C 16, Exchange Buildings, Liverpool.—*See Advt.*

Sulphur—

Sulphuric Acid—
Farmer, Thos., & Co., Mark-lane, London, E.C.—*See Ad.*
Howarth & Co., Miles Platting, Manchester.
Illingworth, Thos., North Dean, nr. Halifax.—*See Advt.*
Nicholson, John & Sons, Leeds.—*See Advt.*

Sulphurous Acid—
Boake, Roberts & Co., Stratford, London, E.—*See Advt.*
Key, Samuel & Co., West Bromwich.

Tar Distillers—
Brotherton & Co., Commercial Buildings, Leeds.
Illingworth, Thos., North Dean, nr. Halifax.—*See Advt.*
Lockwood, H., & Co., Miles Platting, Manchester.—*See Ad*
Metcalf, J., Altham, near Accrington.
Smith & Forrest, Holt Town, Manchester.—*See Advt*

Thermometers and Hydrometers—
Griffin, John J. & Sons, 22, Garrick-st., Covent Garden London.
Harris, P., & Co. Limited, Bull Ring, Birmingham.

Tubes (Gas, Water, and Steam)—
Aird, Joseph, Great Bridge, Staffordshire.—*See Advt.*
Hildick & Hildick, Walsall, Staffordshire.—*See Advt.*
Spencer, John, Globe Tube Works, Wednesbury.

Ultramarine—
Netham Chemical Co., Ltd., Bristol.—*See Advt.*

Vacuum Pans—
Blair, Campbell & McLean, Copper Works, Glasgow.
Manlove, Alliott & Co., Limited, Nottingham.—*See Advt*
Neill, W. & Son St. Helens.

Vitrified Blue Bricks—
Chandley, W., & Co., 20 St. Mary's Gate, Manchester.

Wire Gauzes—

Zinc Salts—
Grimshaw Bros., Ltd., Clayton near Manchester.

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